Report of a Study
by the
Rubber Manufacturers Association
on
Passenger Car and Light Truck Tire Performance
at
High Speed and Endurance

19 December 2000

To assist NHTSA in evaluating the performance capabilities of passenger car and light truck tires, and to help the Agency in selecting revisions to FMVSS 109 and 119 high-speed and endurance tests, the Rubber Manufacturers Association (RMA) designed and administered the test protocol as contained in this report. Seven tire manufacturers participated in this study including Bridgestone/Firestone Inc., Continental/General Tire Inc., Cooper Tire and Rubber Company, Goodyear Tire and Rubber Company, Michelin North America, Pirelli Tire North America, and Yokohama Tire Corporation. The test matrix was divided into the following four principle parts: Passenger Car Tire High Speed, Passenger Car Tire Endurance, Light Truck Tire High Speed, and Light Truck Tire Endurance. In each case the objective of the study was to determine the failure point of selected tires under controlled conditions of ambient temperature, load, inflation pressure, speed and duration. Tests on approximately 900 tires were included in this study. A brief summary of the test conditions, results, and RMA's recommendations follows in the next several paragraphs. A more detailed explanation is contained in the various sections of the report as herewith attached.

The passenger car tire high-speed test matrix included popular tire sizes P235/75R15 S, P205/65R15 T, and P225/60R16 H. The total number of tires tested equaled 546. All tires were tested under various combinations of load (80 and 90% maximum), inflation pressure (180, 240, and 300 kPa), speed (up to and including rated speed of tire), duration (one hour total using six ten-minute steps or three ten-minute steps and one thirty-minute step), and ambient temperature (38°C). If failure did not occur within the one-hour duration, additional steps of 10 km/h for ten-minutes were added until the tire failed. Thus all tires were tested to failure. The SAE J1561 laboratory speed test procedure for passenger car tires was also included in the test matrix for purposes of comparison. The SAE test conditions included 80% maximum load

at 260, or 280 kPa inflation pressure depending on the speed rating of the tire, and the same conditions of speed, duration and ambient temperature cited above. Of the thirty-nine test protocols administered—using various combinations of load, inflation pressure, speed, duration and temperature—the SAE test conditions were found to be the most consistent discriminators required for completion of the rated speed within the customary one-hour duration. Test inflation pressure had the greatest effect in determining completion of the rated speed. Maximum load was also shown to have an effect on performance, although not as great as inflation.

Based on the results of the passenger tire high-speed test study, RMA recommends that NHTSA revise FMVSS 109 to reflect the high-speed test conditions found in SAE J1561 (using a 1.7 meter diameter test wheel). This test would be consistent with ISO 10191 with the last step at ten minutes at the rated speed. The inflation pressure (capped) would be as follows: through speed rating N use 240 kPa; for speed ratings P, Q, R, and S use 260 kPa; for speed ratings T, U, and H use 280 kPa; for speed ratings V, and Z use 300 kPa; and for speed ratings W, and Y use 320 kPa. The initial test speed (ITS) should equal the rated speed minus 40 km/h, and there should be six speed steps: 0 to ITS, ITS, ITS plus 10 km/h, ITS plus 20 km/h, ITS plus 30 km/h, and ITS plus 40 km/h. The speed steps should coincide with six 10-minute duration steps. The test load should equal 80% of the maximum application load. The ambient temperature throughout the test should be 38°C ± 3°C.

Tire size P235/75R15 S was used for the passenger car tire endurance test matrix. Approximately 70 tires were tested. Four test protocols were employed using various conditions of speed (120 and 140 km/h), inflation (160 and 180 kPa), load and duration (100% maximum load for 8 hours, 110% maximum load for 8 hours, and 115% maximum load for 8 hours), and temperature (38°C). If the test tire did not fail by the end of the 24-hour duration period, the test continued with 5% load increase increments for 4 hours each until failure occurred. For comparison purposes the existing FMVSS 109 endurance test was also included in the matrix. If the test tires did not fail by the end of the 34-hour, 109 endurance test, then the test continued with the addition of 15% load increases for 4-hour steps until failure did occur. The results seemed to indicate that speed, followed closely by inflation pressure, are key determinants effecting the number of hours to failure. Tires tested to the 109 endurance test (using a constant speed of 80 km/h and inflation pressure of 180 kPa, with loads ranging from 85 to 100% maximum and a duration of 34-hours) continued on beyond

the customary 34-hour duration and actually reached (with the additional steps of 15% load increases for 4-hours each) an average load at failure of 190% maximum for 3.1 hours or 57.1 total run hours. At loads at or around 100% maximum the duration periods seemed to have marginal impact on failure. It wasn't until load limits became unrealistically high did the tires in the 109 test begin to fail. However, in the four test protocols using combinations of the test conditions cited above, average hours to failure were most realistically demonstrated when testing at 120 km/h using an inflation pressure of 180 kPa. Therefore, regarding the passenger tire endurance test, it is the RMA's recommendation that the current FMVSS 109 endurance test be revised to include: inflation pressure of 180 kPa; speed of 120 km/h; duration and load of 8 hours at 85% maximum, 8 hours at 90% of maximum, and 8 hours at 100% maximum; and ambient temperature of 38°C ± 3°C.

The light truck tire matrix tested sizes LT235/75R15 Load Range C and LT245/75R16 Load Range E. Individual manufacturers were given the freedom to choose among speed ratings of Q, R, or S, however, they were asked to indicate what the speed rating was for the test tire. Speed rating categories were evaluated separately. Approximately 168 tires were included in this test matrix. Tires were tested under various combinations of load (80 and 90% maximum), inflation pressure [290, 350, and 410 kPa for the LT235/75R15 (C), and 490, 550, and 610 kPa for the LT245/75R16 (E)], speed (up to and including rated speed of tire), duration (one hour total using three 10-minute steps and one 30-minute step), and ambient temperature (38°C). If failure did not occur within the 1-hour duration, additional steps of 10 km/h for 10 minutes were added until the tire failed. The SAE J1633, laboratory speed test procedure for light truck tires was also included in the test matrix for purposes of comparison. The SAE test conditions included: for the LT235/75R15 (C) tire, a load of 90% maximum, and an inflation pressure of 350 kPa; and for the LT245/75R16 (E) tire a load of 90% maximum, and an inflation pressure of 550kPa. Other conditions of speed duration and temperature were the same as cited for the general matrix. For the load range C tire an analysis of the results shows the maximum load conditions of 90% to be more realistic that the 80%. Also it appears that the inflation pressure of 350 kPa is most suitable for this test. For the load range E tire the data showed that conditions of 90% maximum load and 550 kPa pressure, while not particularly discerning for the Q speed rated tires, did become much more rigorous for the R speed rated tires (no S rated tires were included in the load range E tests). Based upon the experience of manufacturers and the results of data from this test, it is our recommendation that NHTSA

consider promulgation of a light truck tire high speed test using conditions similar to those found in SAE J1633 or ISO 10454 using maximum pressure. The application of this test should be limited to tires marked "LT" or "C", and tires with load range A through E, or Load Index 124 or below. The inflation pressure for the test should be 100% of the inflation pressure corresponding to the maximum load. The Initial Test Speed (ITS) should equal the tire's rated speed minus 20 km/h and three speed/duration steps should be used: 0 to ITS for 10 minutes, ITS for 10 minutes, ITS plus 10 km/h for 10 minutes, and ITS plus 20 km/h for 30 minutes. The load should be 90% of the maximum single tire load, and the ambient temperature should be 38°C ± 3°C.

The light truck tire endurance test used the same two popular tire sizes as the high-speed test matrix, LT235/75R15 Load Range C, and LT 245/75R16 Load Range E. Approximately 140 tires were included in this test. Four test protocols, for each tire size, using various conditions of speed (120 and 140 km/h), inflation (290 and 350 kPa), load and duration (100% maximum load for 8 hours, 110% maximum load for 8 hours, and 115% maximum load for 8 hours), and temperature (38°C). If the test tire did not fail by the end of the 24-hour duration period, the test continued with 5% load increase increments for 4 hours each until failure occurred. For comparison purposes the existing FMVSS 119 endurance test was also included in the matrix. If the test tires did not fail by the end of the 47-hour FMVSS 119 endurance test, then the test continued with the addition of 15% load increases for 4-hour steps until failure did occur. As with the passenger car endurance tests, speed deemed to be the greatest determinate of tire failure, followed closely by inflation pressure. Tires tested to the 119 endurance test (using a constant speed of 80 km/h and inflation pressure of 350 kPa, with loads ranging from 75 to 114 % maximum and duration of 47-hours) continued beyond the customary 47-hour duration and actually reached (with the additional steps of 15% load increases for 4-hours each) an average load at failure of 219% maximum for 3 hours or 74 total run hours for the LT235/75R15 (C) tires, and 211% maximum for 3 hours or 74 total run hours for the LT245/75R16 (E) tires. At loads around 114% maximum, the duration periods seemed to have marginal impact on failure. In the FMVSS 119 test it wasn't until load limits became unrealistically high that tires begin to fail. However, in the four test protocols using combinations of the test conditions cited above, average hours to failure were more realistically demonstrated when testing at 120 km/h using the inflation pressures corresponding to the maximum load rating marked on the tire (350 kPa for load range C, and 550 kPa for load range E). Therefore, regarding the light truck tire endurance test, it is the

RMA's recommendation that the current FMVSS 119 endurance test be revised to include: a constant speed of 120 km/h; inflation pressure corresponding to the maximum load rating marked on the tire; duration and load (for load range A, B, C, and D) of 8 hours at 75% maximum load, 8 hours at 97% maximum, and 8 hours at114% maximum load; duration and load (for load range E) of 8 hours at 70% maximum load, 8 hours at 88% maximum load and 8 hours at 106% maximum load; and ambient temperature of 38°C ± 3°C.

RMA recognizes that future discussion items may include tire sidewall labeling, consumer information, and structural integrity and durability testing.

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Passenger Tire High Speed

RMA High Speed Test Matrix for Study on Passenger Car Tires

The object of this study was to determine the failure point of selected tires under controlled conditions of ambient temperature, load, inflation pressure, speed, and duration. Popular tire sizes and speed ratings were selected for testing. The SAE J1561, Laboratory Speed Test Procedure for Passenger Car Tires, with the addition—beyond the specified six, ten-minutes steps—of incremental steps of 10 kph for 10 minutes each until failure occurred, was included for purposes of comparison.

Tire sizes included: P235/75R15 S, P205/65R15 T, and P225/60R16 H. To help eliminate anomalies, for each tire size and speed rating tested, two tires were tested (#1 tire and #2 tire) for each and every test conducted. Each test tire was mounted on the test rim (test rim width tolerance of ± ½ inch) and inflated to the applicable inflation pressure without further adjustment during the test. The mounted test tires were conditioned at the ambient temperature of the test room (38^{o} C) for at least three hours.

Test conditions for ambient temperature, load, and inflation pressure are listed in the test matrix on the following pages.

Two speed tests were conducted for each tire under the same conditions of ambient temperature, load, and inflation pressure. The Initial Test Speed (ITS) and the Rated Speed (RS) were measured in kilometers per hour (kph). For the first speed test ITS was equal to RS less 40 kph. For the second speed test ITS was equal to RS less 20 kph. The tests proceeded through the following incremental speed increases using ten-minute duration steps except for the one thirty-minute step as shown below.

Speed steps when ITS = RS – 40 kph

Speed step	0 kph to ITS	for 10 minutes
Speed step	ITS	for 10 minutes
Speed step	ITS plus10 kph	for 10 minutes
Speed step	ITS plus 20 kph	for 10 minutes
Speed step	ITS plus 30 kph	for 10 minutes
Speed step	ITS plus 40 kph	for 10 minutes

TOTAL TIME 60 MINUTES

Speed steps when ITS = RS – 20 kph

Speed step	0 kph to ITS	for 10 minutes
Speed step	ITS	for 10 minutes
Speed step	ITS plus10 kph	for 10 minutes
Speed step	ITS plus 20 kph	for 30 minutes

TOTAL TIME 60 MINUTES

Test operators recorded the failure point of each test tire in terms of the number of minutes run during the step at which failure occurred. This number ranged from 0 to 10 minutes, except in the case of the one 30-minute step as found in

the ITS = RS – 20 test routine. In the example table for the H rated tire size shown below, during the ITS = RS – 40 test regimen, if the number 1 test tire failed during the 9th minute of the ITS plus 40 duration step (the last or sixth ten-minute duration step of this one-hour test), the result would have been recorded as 9 minutes at 210 kph. Similarly, during the ITS = RS – 20 test routine for the H rated tire listed in the example shown below, if the number two tire failed during the 24th minute of the 30-minute ITS plus 20 duration step (the fourth step in this one-hour test), the result would have been recorded as 24 minutes at 210 kph.

If there was no tire failure at the end of the one-hour test routine, then the operator continued the test regimen by subjecting the tire to additional speed increases of 10 kilometer/hour increments for 10-minute durations until failure did occur. In the example below if the number two tire of the ITS = RS – 40 test routine completed all six of the ten-minute duration periods without failure and then continued on for an additional two speed increase steps, failing in the 7th minute of the ITS plus 60 step, the result would have been recorded as: 7 minutes at 230 kph. Similarly, if the number one tire of the ITS = RS – 20 test routine shown below completed the one hour test without failing, but then failed 3 minutes into the first additional step (10 kph increase for 10 minutes), the data would have been recorded: 3 minutes at 220 kph.

Example of Completed Test Data

TIRE SIZE	**LOAD** (%)	**INFLATION** (kPa)	**SPEED** (kph) (ITS = Initial Test Speed RS = Rated Speed)	**DURATION** (Minutes)	**AMBIENT TEMP.** (^{o} Celsius)	**TOTAL TIME** (Hours)	**FAILURE** (Minutes @ Speed in kph)
P225/60R16 H	90	180	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire *9 min @ 210 kph* #2 tire *7 min @ 230 kph*
	90	180	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire *3 min @ 220 kph* #2 tire *24 min @ 210 kph*

On the following pages is the test matrix.

TIRE SIZE	LOAD (%)	INFLATION (kPa)	SPEED (kph) (ITS = Initial Test Speed RS = Rated Speed)	DURATION (Minutes)	AMBIENT TEMP. (^{o}C)	TOTAL TIME (Hours)	FAILURE (Minutes @ Speed in kph)
P235/75R15 S	80	180	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	80	180	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P205/65R 15 T	80	180	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	80	180	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P225/60R16 H	80	180	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	80	180	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire

TIRE SIZE	LOAD (%)	INFLATION (kPa)	SPEED (kph) (ITS = Initial Test Speed RS = Rated Speed)	DURATION (Minutes)	AMBIENT TEMP. (^{o}C)	TOTAL TIME (Hours)	FAILURE (Minutes @ Speed in kph)
P235/75R15 S	80	240	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	80	240	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P205/65R 15 T	80	240	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	80	240	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P225/60R16 H	80	240	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	80	240	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire

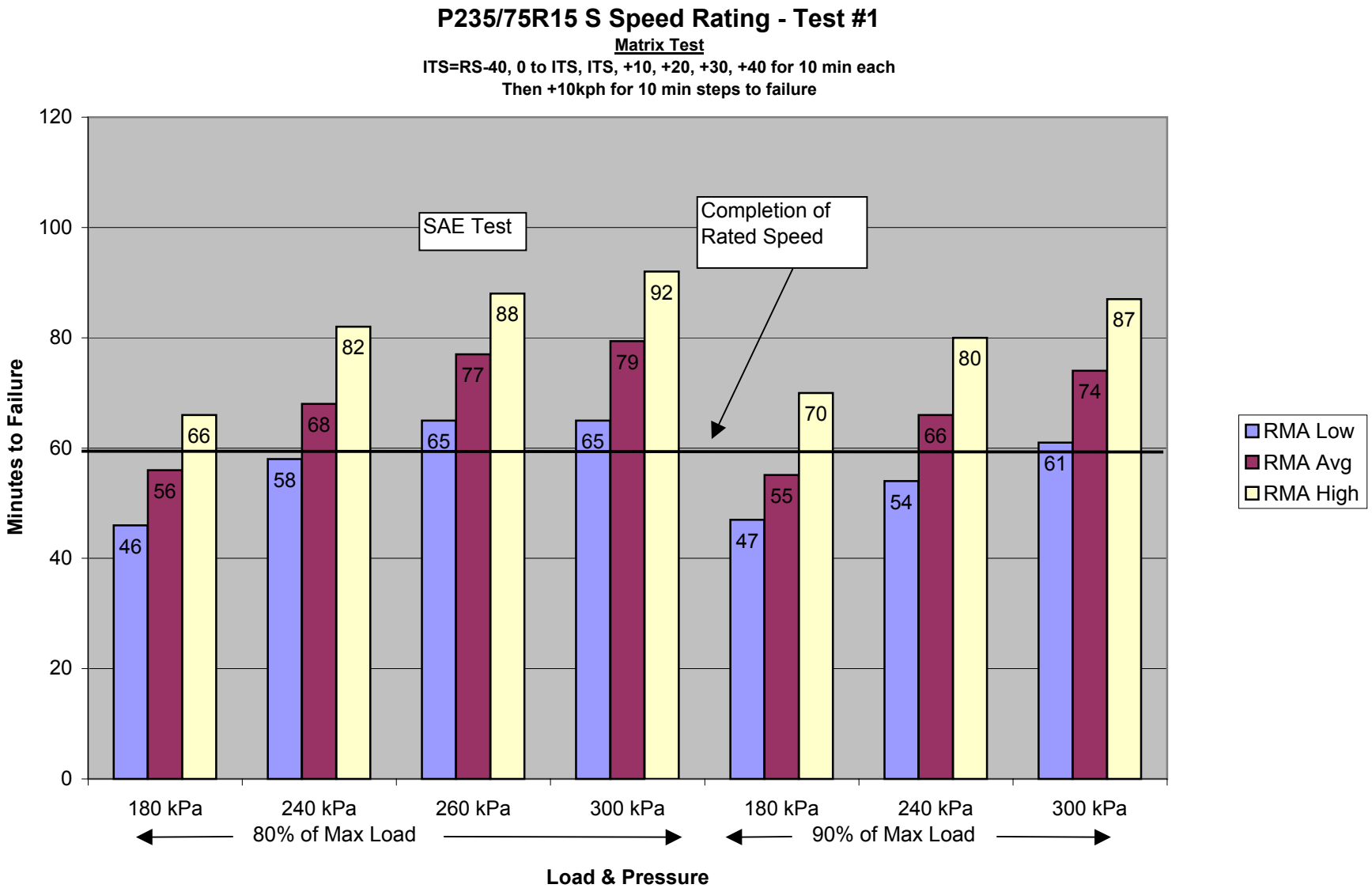
TIRE SIZE	**LOAD** (%)	**INFLATION** (kPa)	**SPEED** (kph) (ITS = Initial Test Speed RS = Rated Speed)	**DURATION** (Minutes)	**AMBIENT TEMP.** (^{o} C)	**TOTAL TIME** (Hours)	**FAILURE** (Minutes @ Speed in kph)
P235/75R15 S	80	260	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure) **Will serve as SAE J1561 Test**	10, 10, 10, 10, 10, 10	38	1	#1 tire #2 tire
P205/65R 15 T	80	280	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure) **Will serve as SAE J1561 Test**	10, 10, 10, 10, 10, 10	38	1	#1 tire #2 tire
P225/60R16 H	80	280	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure) **Will serve as SAE J1561 Test**	10, 10, 10, 10, 10, 10	38	1	#1 tire #2 tire

TIRE SIZE	**LOAD** (%)	**INFLATION** (kPa)	**SPEED** (kph) (ITS = Initial Test Speed RS = Rated Speed)	**DURATION** (Minutes)	**AMBIENT TEMP.** (^{o} C)	**TOTAL TIME** (Hours)	**FAILURE** (Minutes @ Speed in kph)
P235/75R15 S	80	300	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	80	300	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P205/65R 15 T	80	300	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	80	300	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P225/60R16 H	80	300	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	80	300	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire

TIRE SIZE	**LOAD** (%)	**INFLATION** (kPa)	**SPEED** (kph) (ITS = Initial Test Speed RS = Rated Speed)	**DURATION** (Minutes)	**AMBIENT TEMP.** (^{o} C)	**TOTAL TIME** (Hours)	**FAILURE** (Minutes @ Speed in kph)
P235/75R15 S	90	180	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	90	180	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P205/65R 15 T	90	180	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	90	180	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P225/60R16 H	90	180	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	90	180	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire

TIRE SIZE	LOAD (%)	INFLATION (kPa)	SPEED (kph) (ITS = Initial Test Speed RS = Rated Speed)	DURATION (Minutes)	AMBIENT TEMP. (^{o} C)	TOTAL TIME (Hours)	FAILURE (Minutes @ Speed in kph)
P235/75R15 S	90	240	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	90	240	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P205/65R 15 T	90	240	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	90	240	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P225/60R16 H	90	240	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	90	240	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire

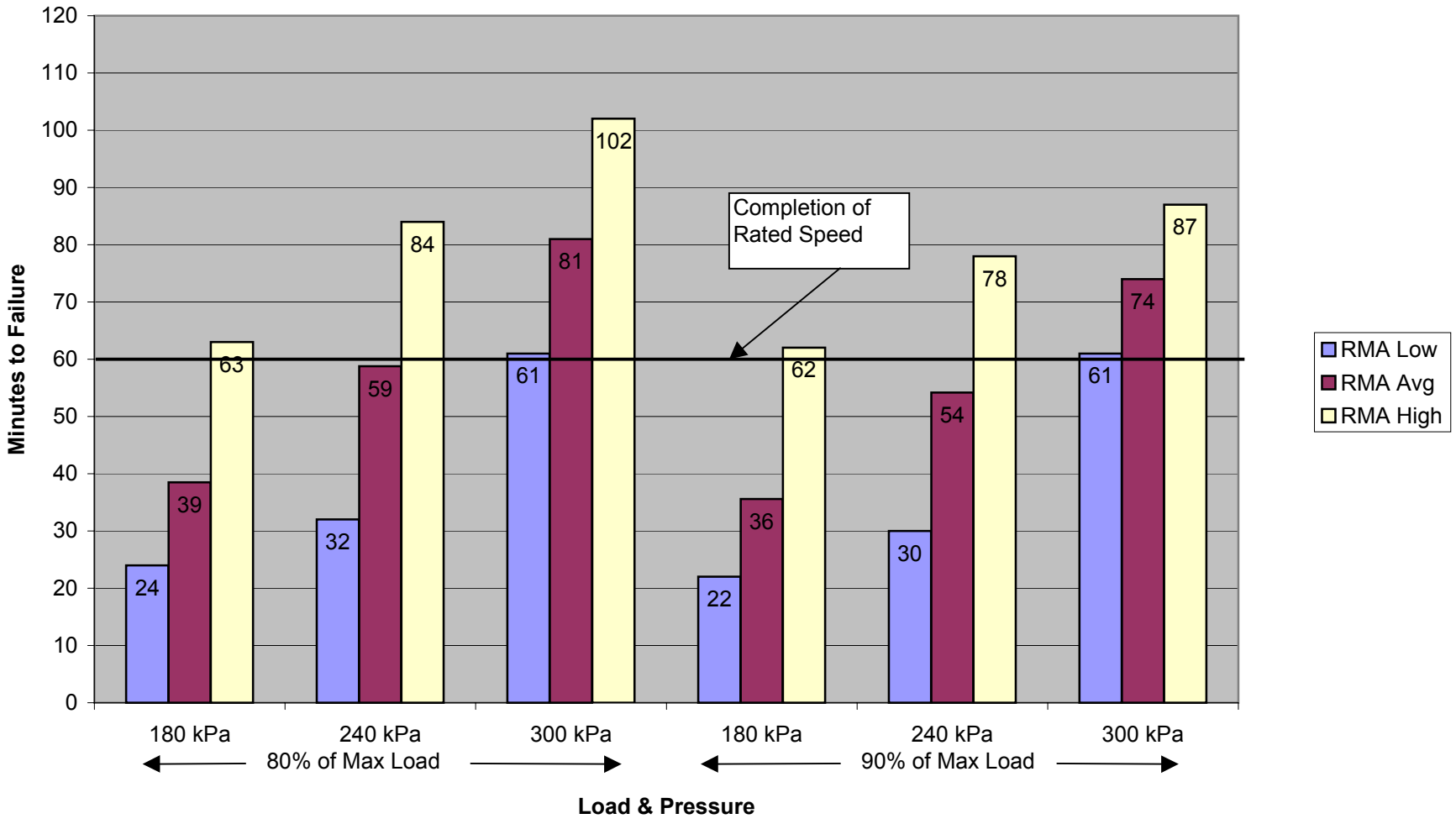
TIRE SIZE	LOAD (%)	INFLATION (kPa)	SPEED (kph) (ITS = Initial Test Speed RS = Rated Speed)	DURATION (Minutes)	AMBIENT TEMP. (^{o} C)	TOTAL TIME (Hours)	FAILURE (Minutes @ Speed in kph)
P235/75R15 S	90	300	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	90	300	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P205/65R 15 T	90	300	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	90	300	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure	10, 10, 10, 30	38	1	#1 tire
							#2 tire
P225/60R16 H	90	300	ITS = RS – 40 0 to ITS, ITS, +10 +20 +30 +40 (+10kph for 10 min steps to failure)	10, 10, 10, 10, 10, 10	38	1	#1 tire
							#2 tire
	90	300	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire
							#2 tire

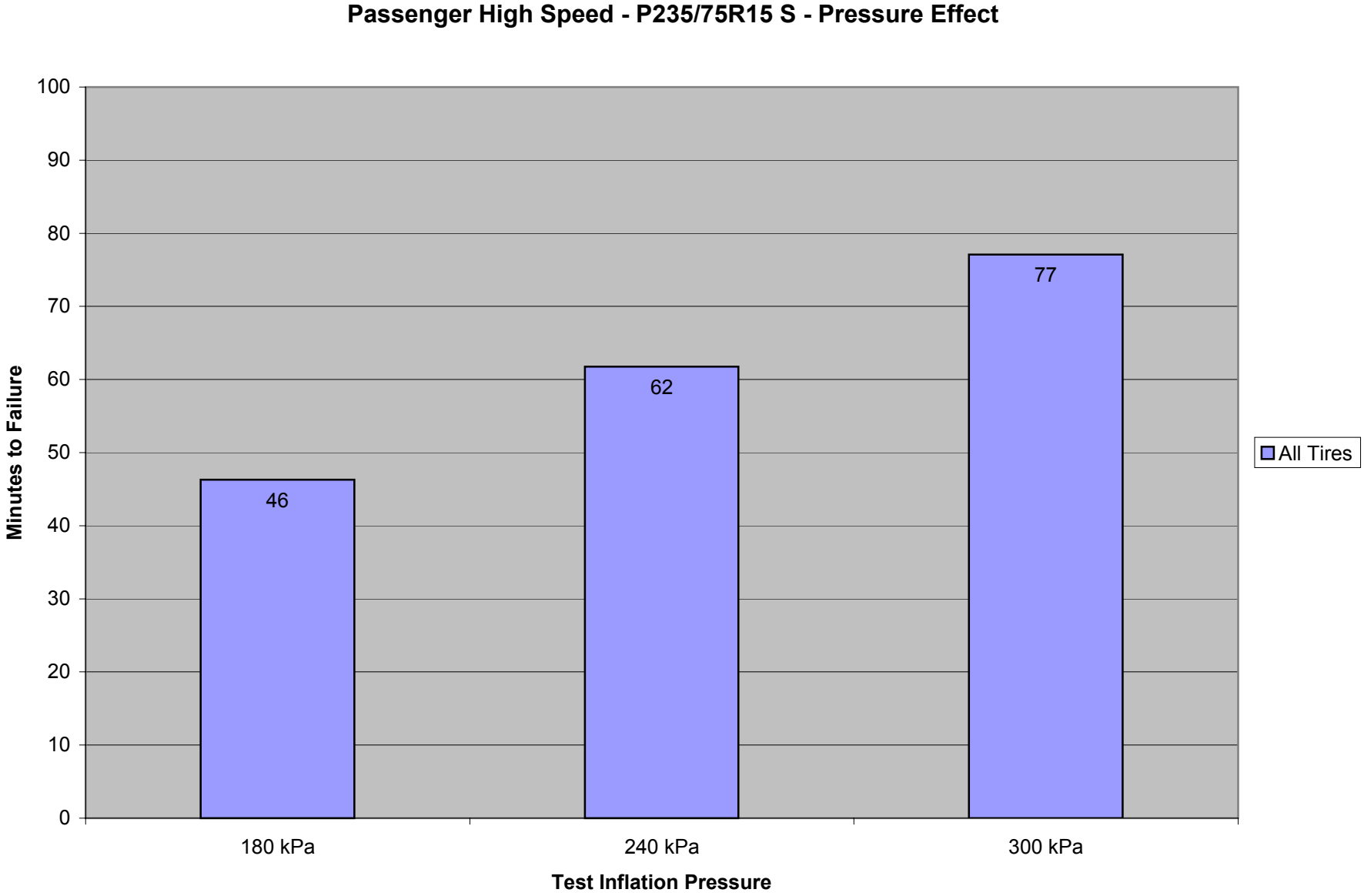

P235/75R15 S Speed Rating - Test #1
Matrix Test
ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each
Then +10kph for 10 min steps to failure
Minutes to Failure
120
100
80
60
40
20
0
SAE Test
Completion of Rated Speed
46
56
66
58
68
82
65
77
88
65
79
92
47
55
70
54
66
80
61
74
87
180 kPa
240 kPa
260 kPa
300 kPa
180 kPa
240 kPa
300 kPa
80% of Max Load
90% of Max Load
Load & Pressure
RMA Low
RMA Avg
RMA High

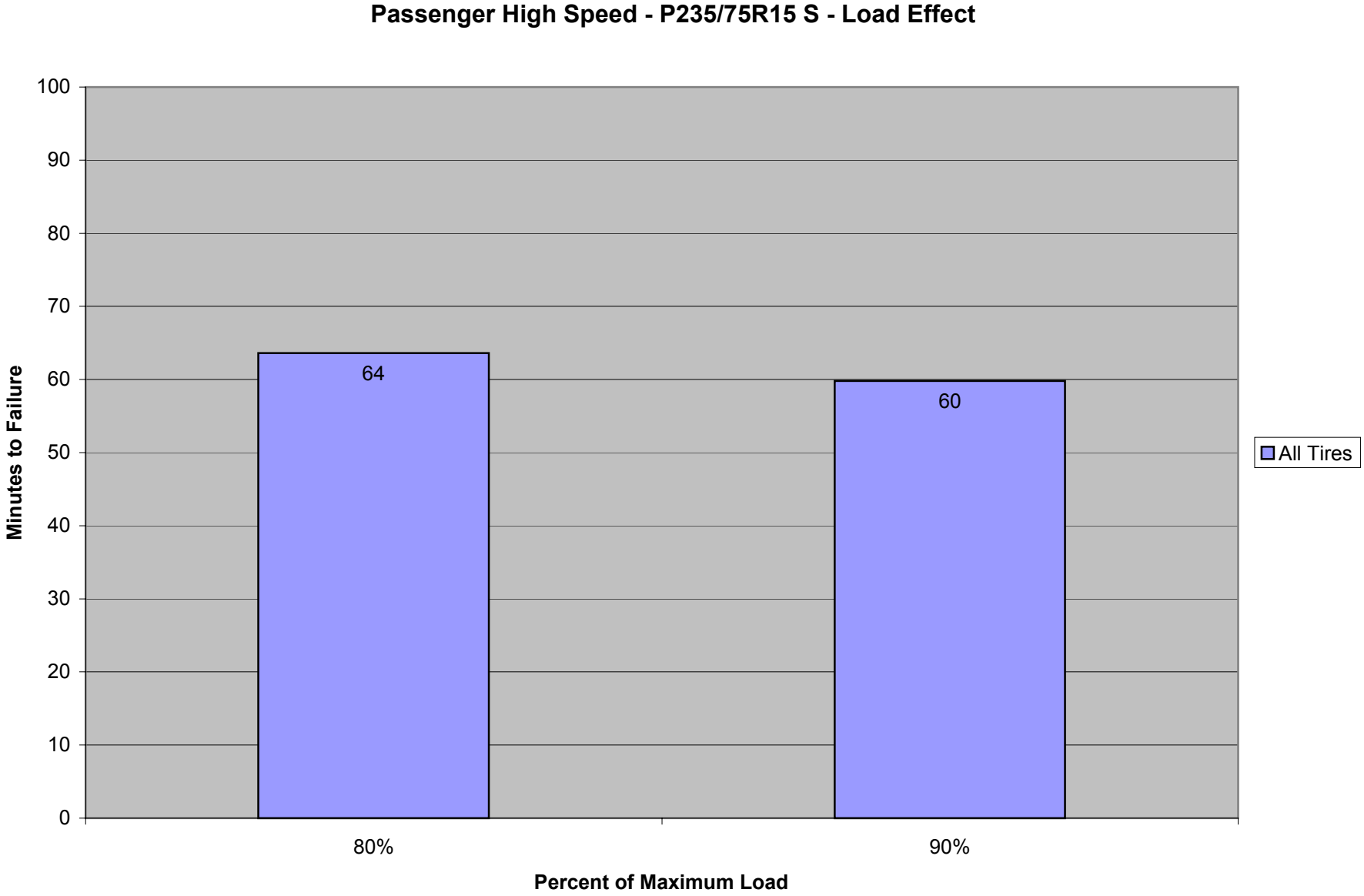
P235/75R15 S Speed Rating - Test #2

Matrix Test

ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure




Passenger High Speed - P235/75R15 S - Pressure Effect
Minutes to Failure
100
90
80
70
60
50
40
30
20
10
0
46
62
77
180 kPa
240 kPa
300 kPa
Test Inflation Pressure
All Tires

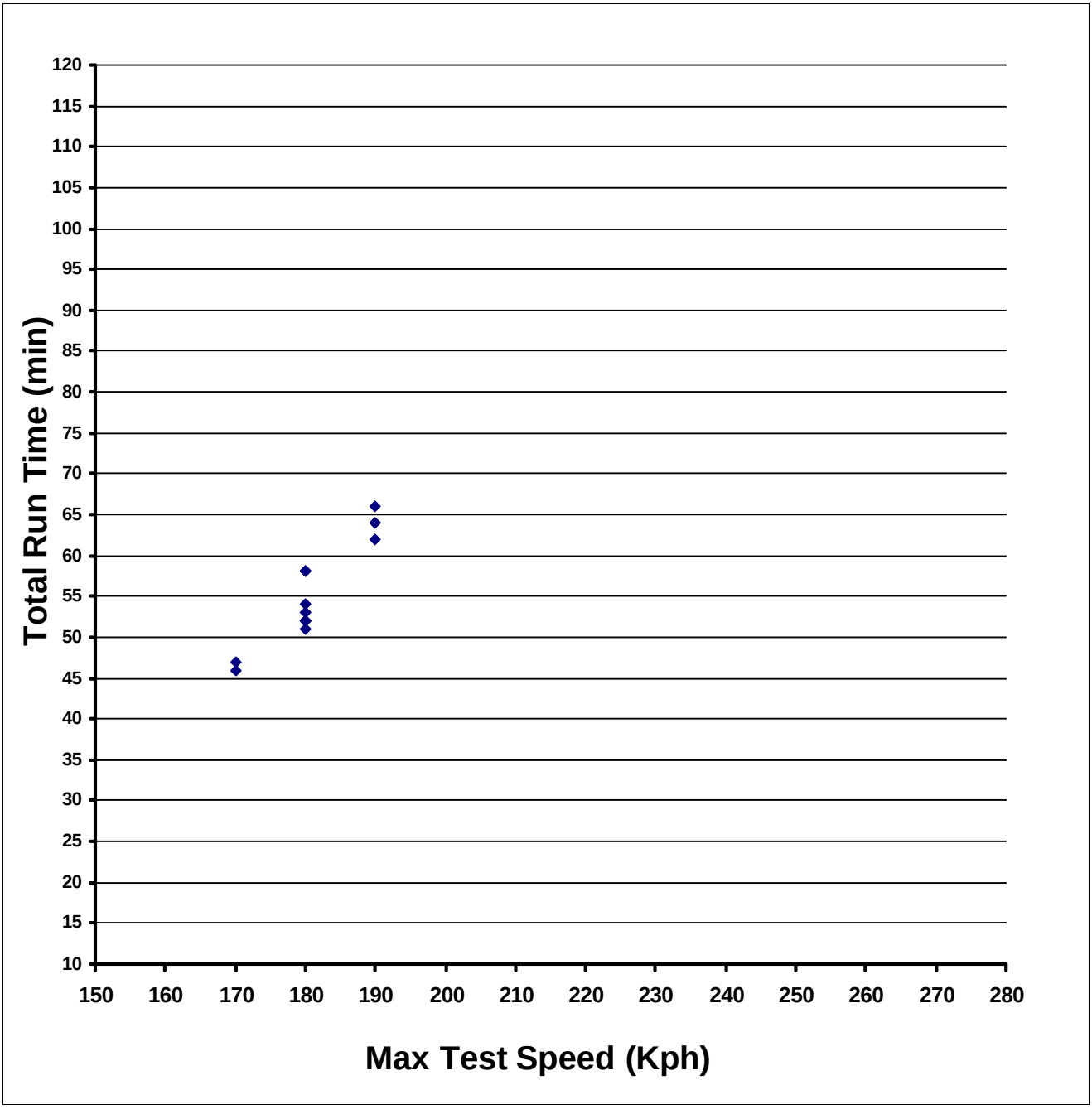

Passenger High Speed - P235/75R15 S - Load Effect
100
90
80
70
60
50
40
30
20
10
0
Minutes to Failure
64
60
80%
90%
Percent of Maximum Load
All Tires

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-80-180-A-RMA

Size: P235/75R15 Speed: S Load (%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-80-180-A-RMA

Size: P235/75R15 Speed: S Load(%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

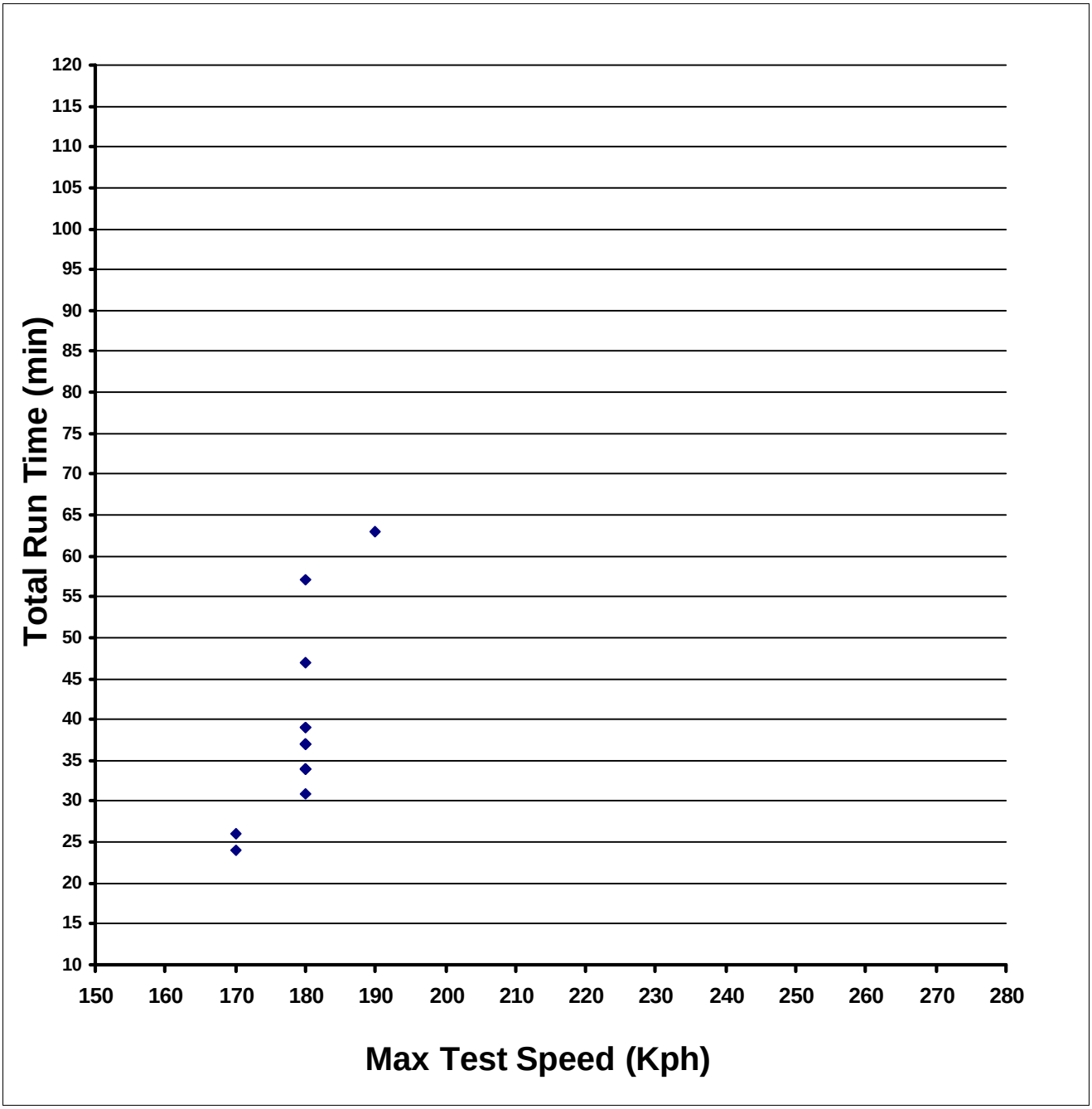
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	190	6	66
	190	4	64
	190	4	64
	190	2	62
	180	8	58
	180	8	58
	180	4	54
	180	3	53
	180	2	52
	180	2	52
	180	2	52
	180	1	51
	170	7	47
	170	6	46
Maximum:	**190**		**66**
Minimum:	**170**		**46**
Average:			**55.643**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-80-180-B-RMA

Size: P235/75R15 Speed: S Load (%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-80-180-B-RMA

Size: P235/75R15 Speed: S Load(%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

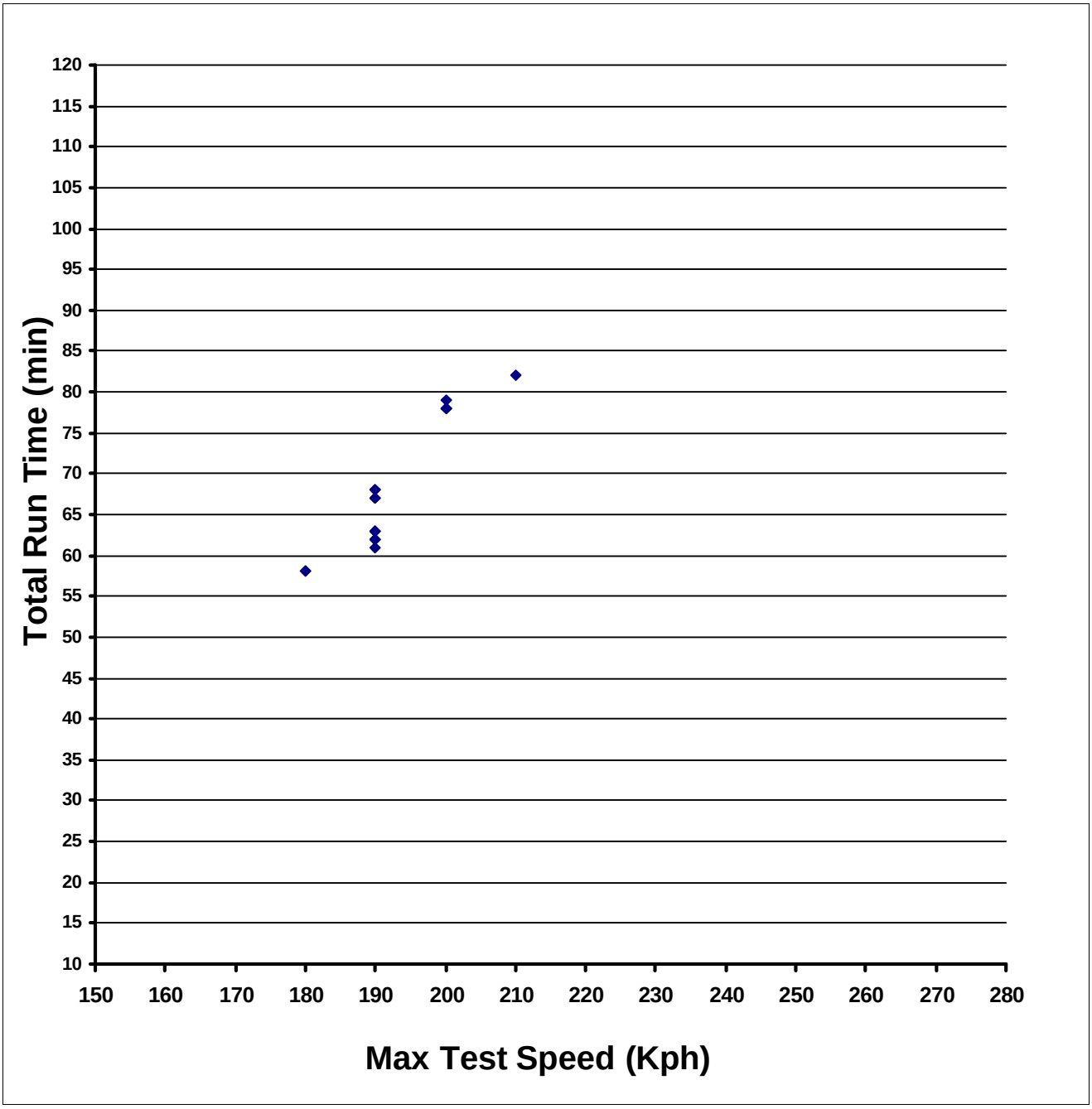
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	190	3	63
	180	27	57
	180	17	47
	180	9	39
	180	9	39
	180	7	37
	180	7	37
	180	7	37
	180	4	34
	180	4	34
	180	4	34
	180	1	31
	170	6	26
	170	4	24
Maximum:	**190**		**63**
Minimum:	**170**		**24**
Average:			**38.5**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-80-240-A-RMA

Size: P235/75R15 Speed: S Load (%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-80-240-A-RMA

Size: P235/75R15 **Speed: S** **Load(%) 80** **Inflation(kPa): 240**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

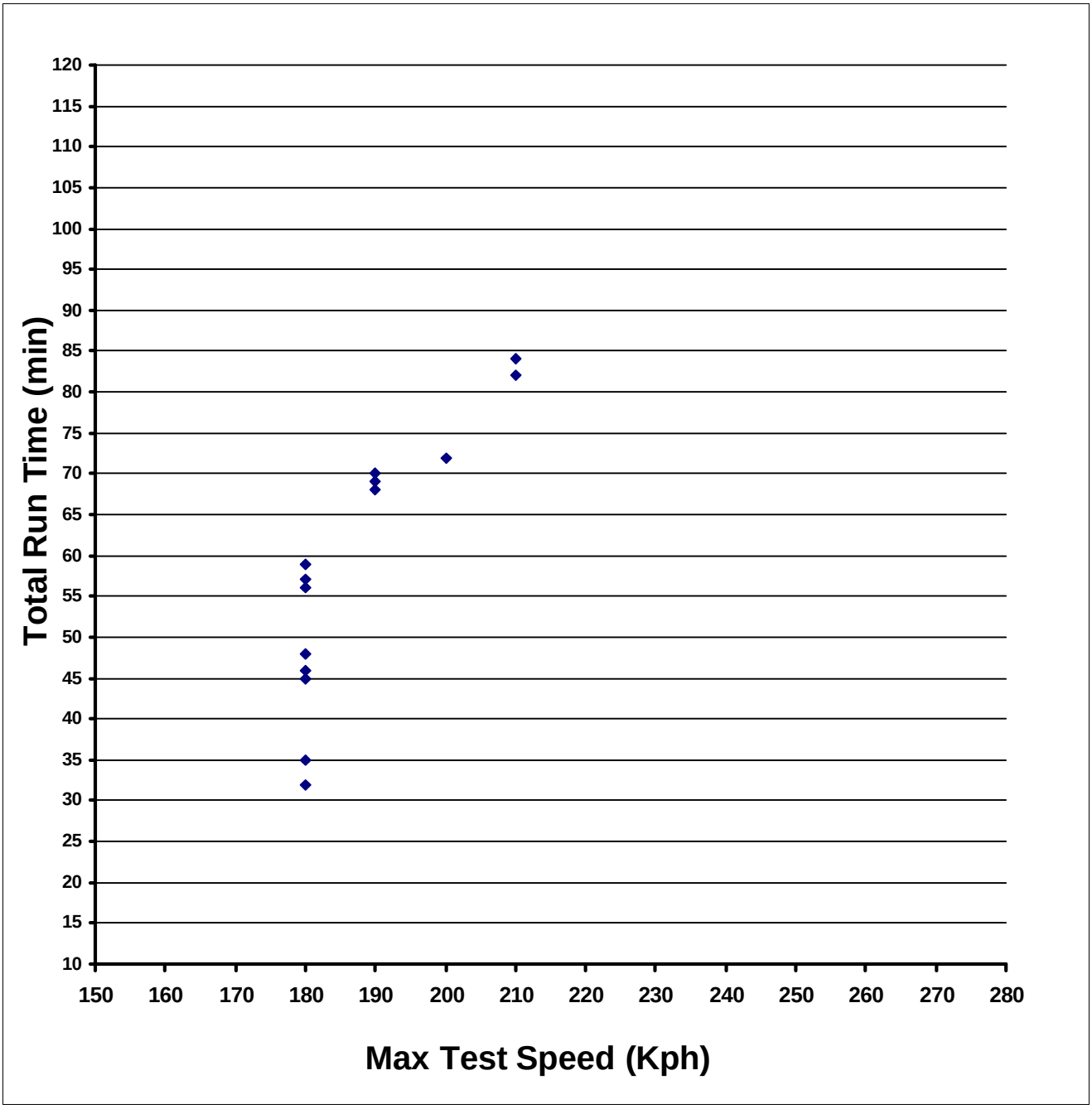
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	2	82
	200	9	79
	200	8	78
	200	8	78
	190	8	68
	190	8	68
	190	7	67
	190	7	67
	190	3	63
	190	3	63
	190	2	62
	190	2	62
	190	1	61
	180	8	58
Maximum:	**210**		**82**
Minimum:	**180**		**58**
Average:			**68.286**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-80-240-B-RMA

Size: P235/75R15 Speed: S Load (%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-80-240-B-RMA

Size: P235/75R15 Speed: S Load(%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

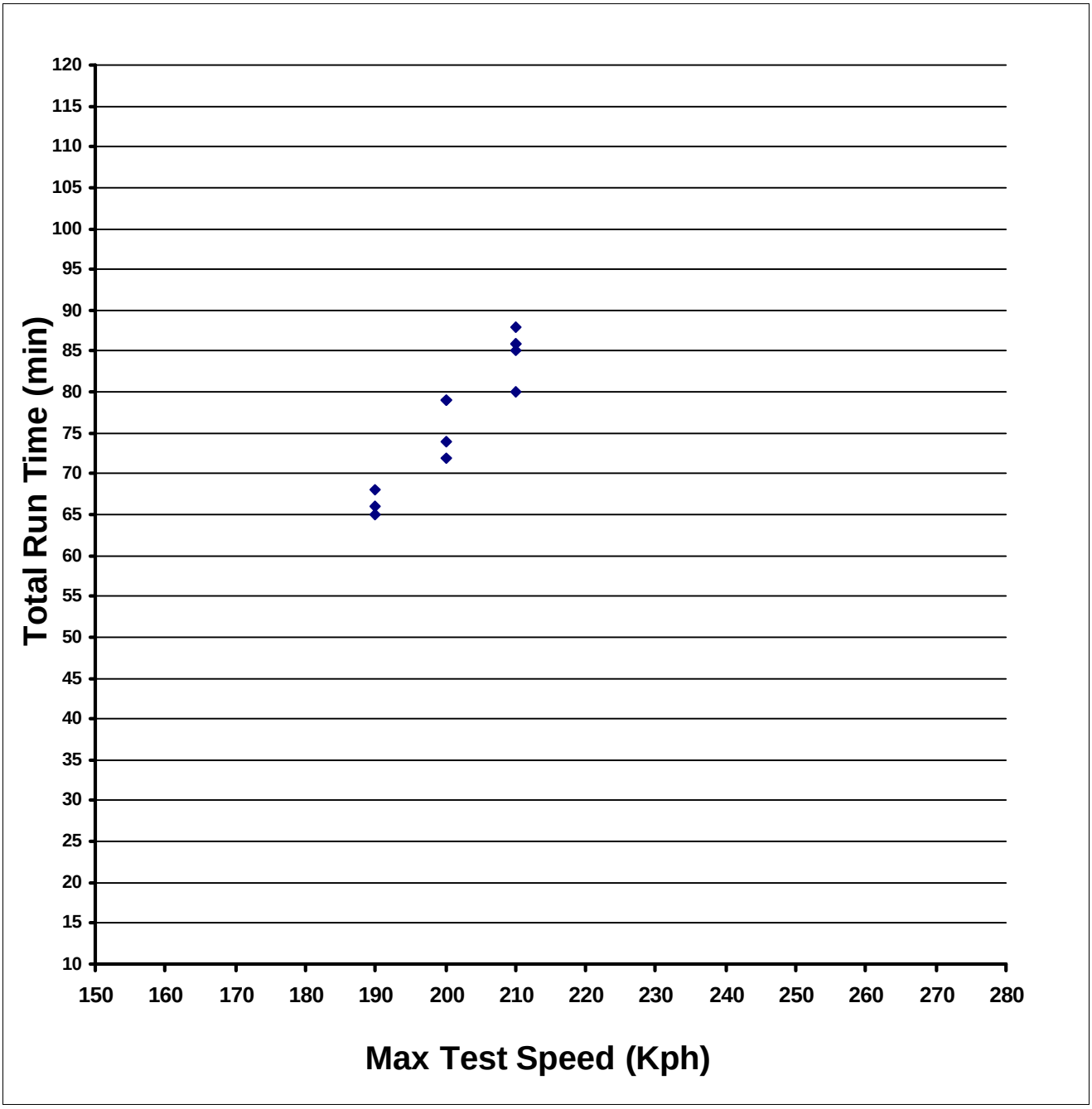
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	4	84
	210	2	82
	200	2	72
	190	10	70
	190	9	69
	190	8	68
	180	29	59
	180	27	57
	180	26	56
	180	18	48
	180	16	46
	180	15	45
	180	5	35
	180	2	32
Maximum:	**210**		**84**
Minimum:	**180**		**32**
Average:			**58.786**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-80-260-A-SAE J1561

Size: P235/75R15 Speed: S Load (%) 80 Inflation(kPa): 260

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-80-260-A-SAE J1561

Size: P235/75R15 Speed: S Load(%) 80 Inflation(kPa): 260

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

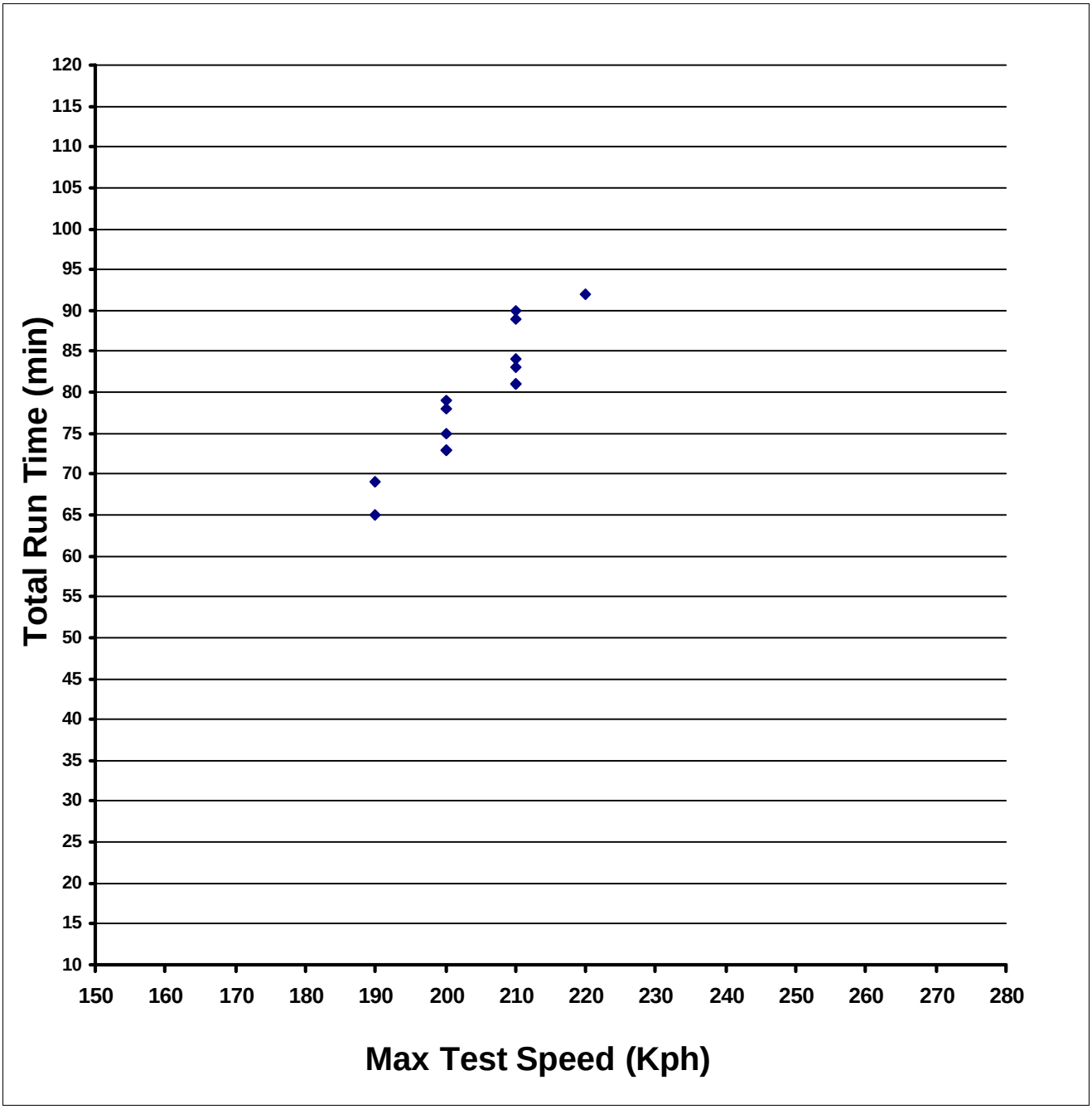
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	8	88
	210	6	86
	210	6	86
	210	5	85
	210	1E-06	80
	200	9	79
	200	9	79
	200	4	74
	200	2	72
	190	8	68
	190	6	66
	190	5	65
Maximum:	**210**		**88**
Minimum:	**190**		**65**
Average:			**77.333**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-80-300-A-RMA

Size: P235/75R15 Speed: S Load (%) 80 Inflation(kPa): 300

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-80-300-A-RMA

Size: P235/75R15 **Speed: S** **Load(%) 80** **Inflation(kPa): 300**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

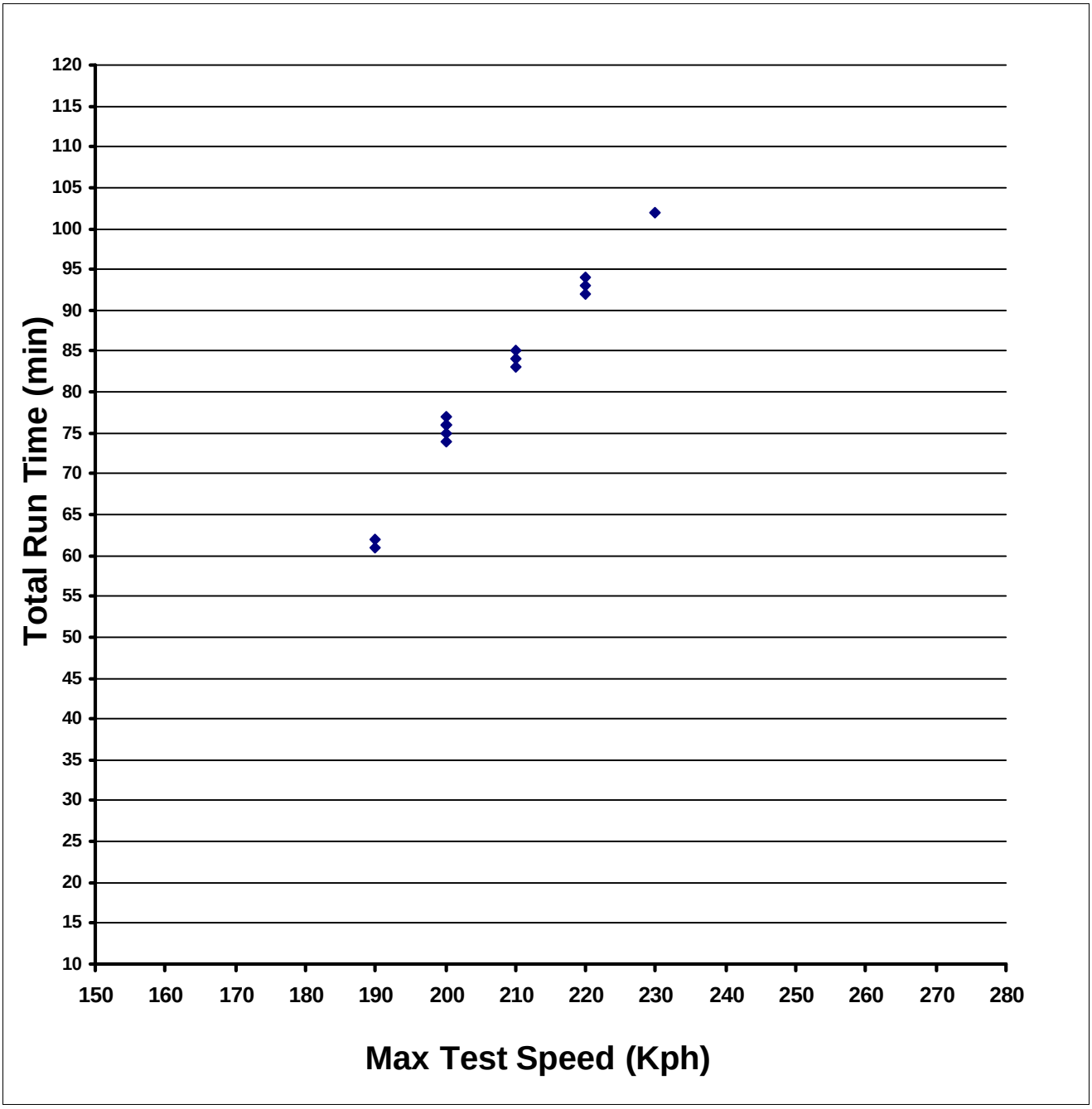
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	2	92
	210	10	90
	210	9	89
	210	4	84
	210	3	83
	210	1	81
	210	1	81
	200	9	79
	200	8	78
	200	5	75
	200	3	73
	200	3	73
	190	9	69
	190	5	65
Maximum:	**220**		**92**
Minimum:	**190**		**65**
Average:			**79.429**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-80-300-B-RMA

Size: P235/75R15 Speed: S Load (%) 80 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-80-300-B-RMA

Size: P235/75R15 Speed: S Load(%) 80 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

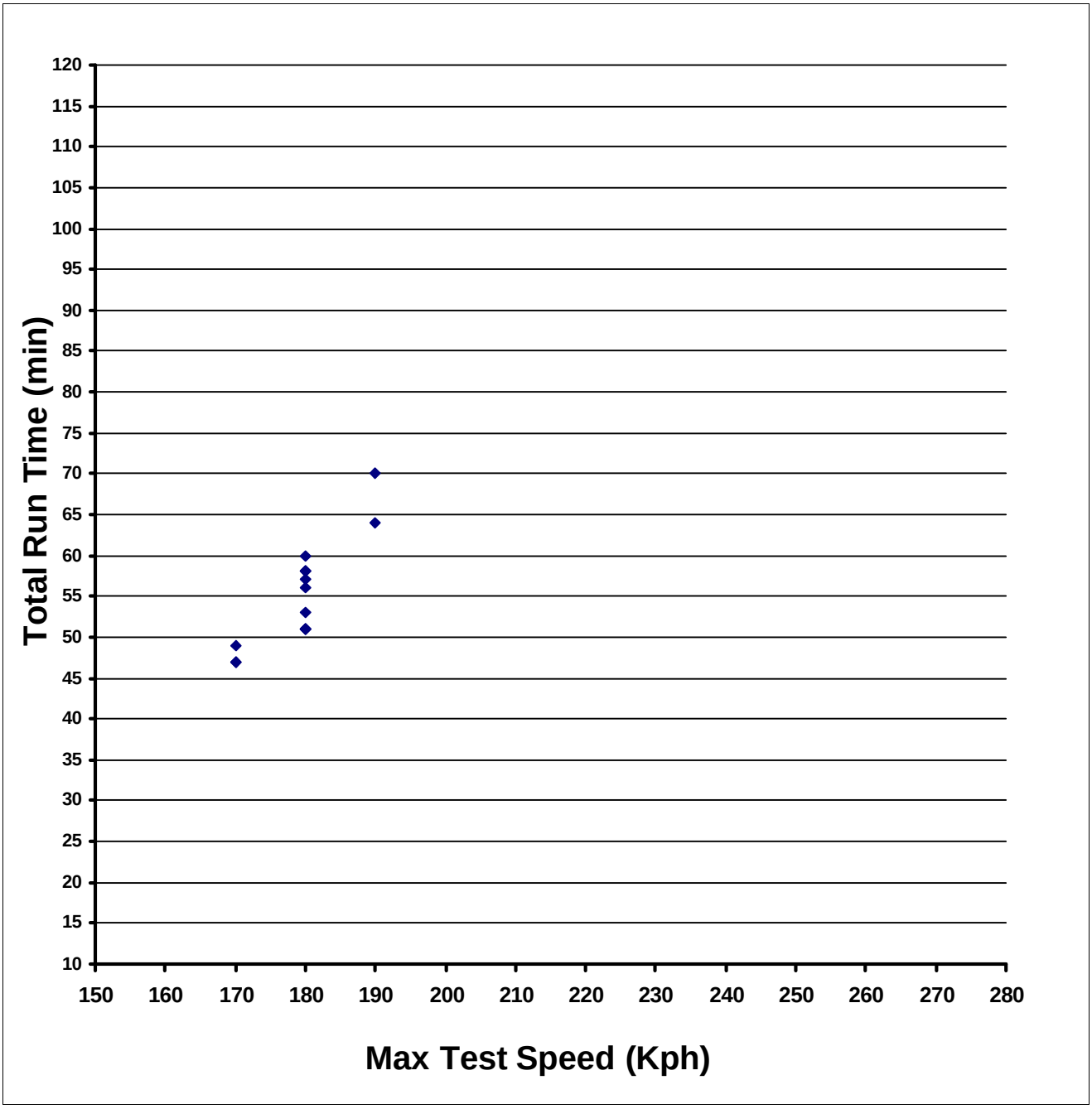
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	230	2	102
	220	4	94
	220	3	93
	220	2	92
	210	5	85
	210	4	84
	210	3	83
	200	7	77
	200	6	76
	200	6	76
	200	5	75
	200	4	74
	190	2	62
	190	1	61
Maximum:	**230**		**102**
Minimum:	**190**		**61**
Average:			**81**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-90-180-A-RMA

Size: P235/75R15 Speed: S Load (%) 90 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-90-180-A-RMA

Size: P235/75R15 **Speed: S** **Load(%) 90** **Inflation(kPa): 180**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

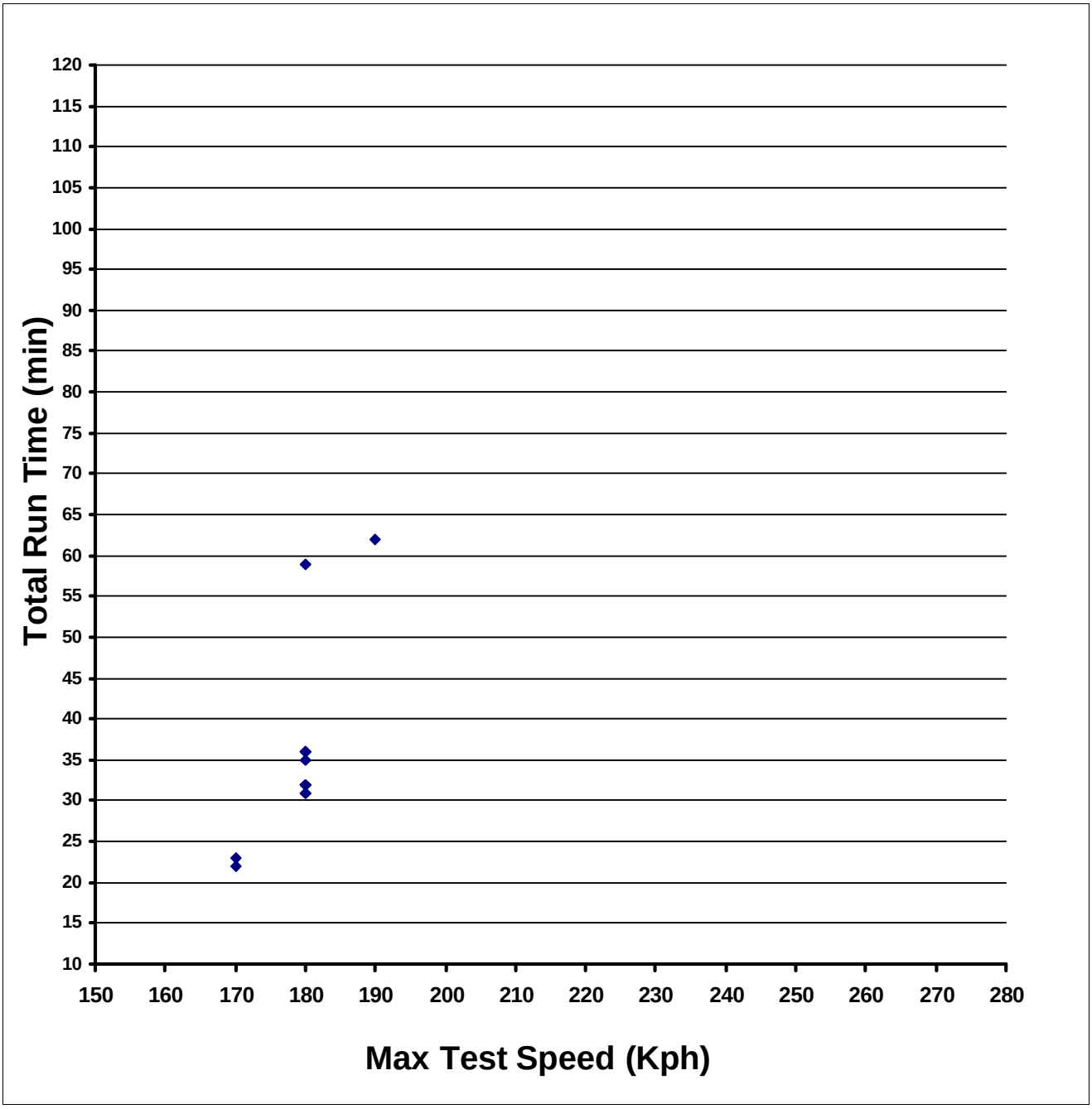
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	190	10	70
	190	4	64
	180	10	60
	180	8	58
	180	8	58
	180	7	57
	180	6	56
	180	3	53
	180	1	51
	180	1	51
	180	1	51
	170	9	49
	170	7	47
	170	7	47
Maximum:	**190**		**70**
Minimum:	**170**		**47**
Average:			**55.143**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-90-180-B-RMA

Size: P235/75R15 Speed: S Load (%) 90 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-90-180-B-RMA

Size: P235/75R15 **Speed: S** **Load(%) 90** **Inflation(kPa): 180**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

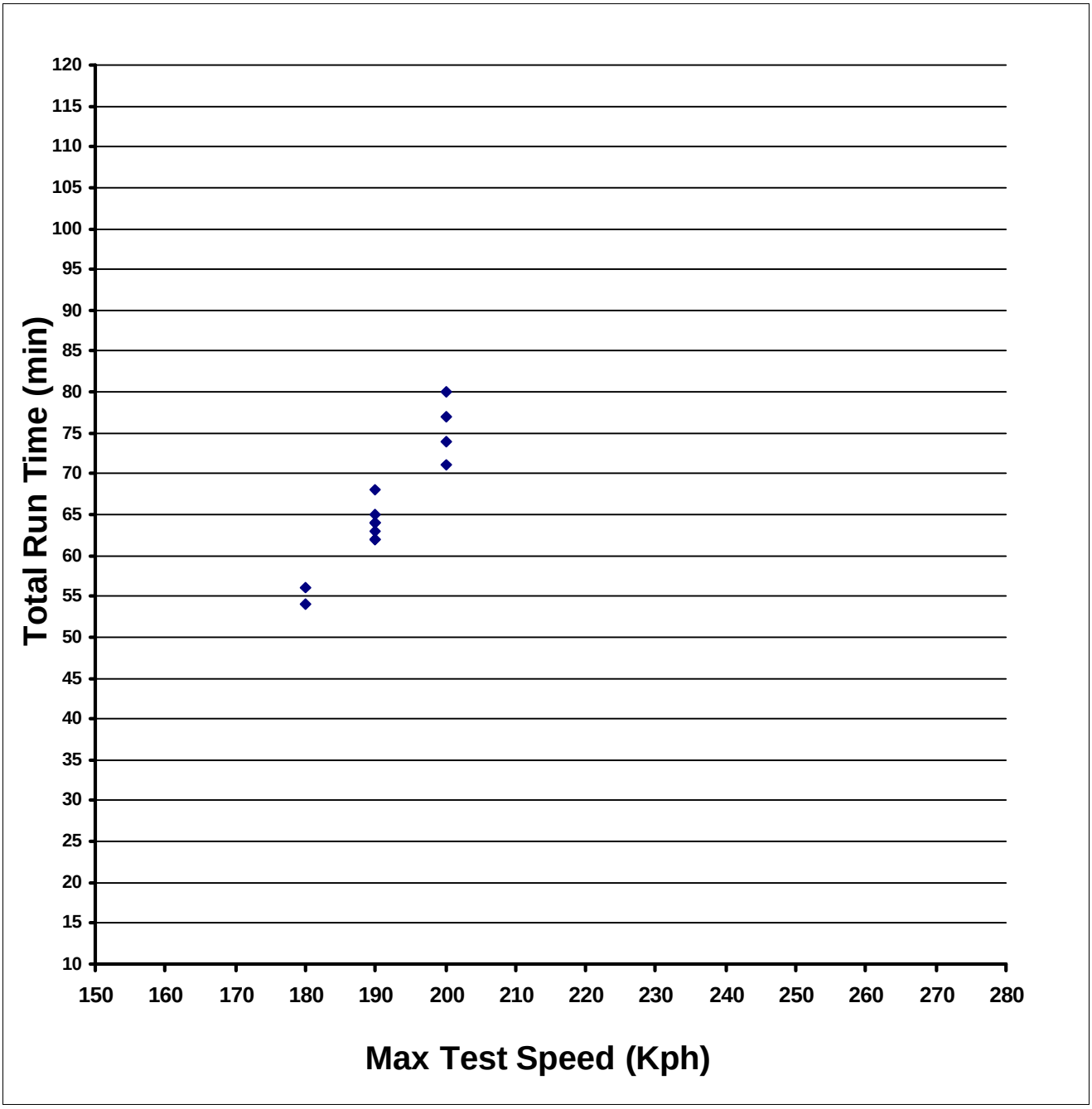
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	190	2	62
	180	29	59
	180	6	36
	180	6	36
	180	6	36
	180	5	35
	180	2	32
	180	2	32
	180	2	32
	180	2	32
	180	1	31
	180	1	31
	170	3	23
	170	2	22
Maximum:	**190**		**62**
Minimum:	**170**		**22**
Average:			**35.643**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-90-240-A-RMA

Size: P235/75R15 Speed: S Load (%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-90-240-A-RMA

Size: P235/75R15 Speed: S Load(%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

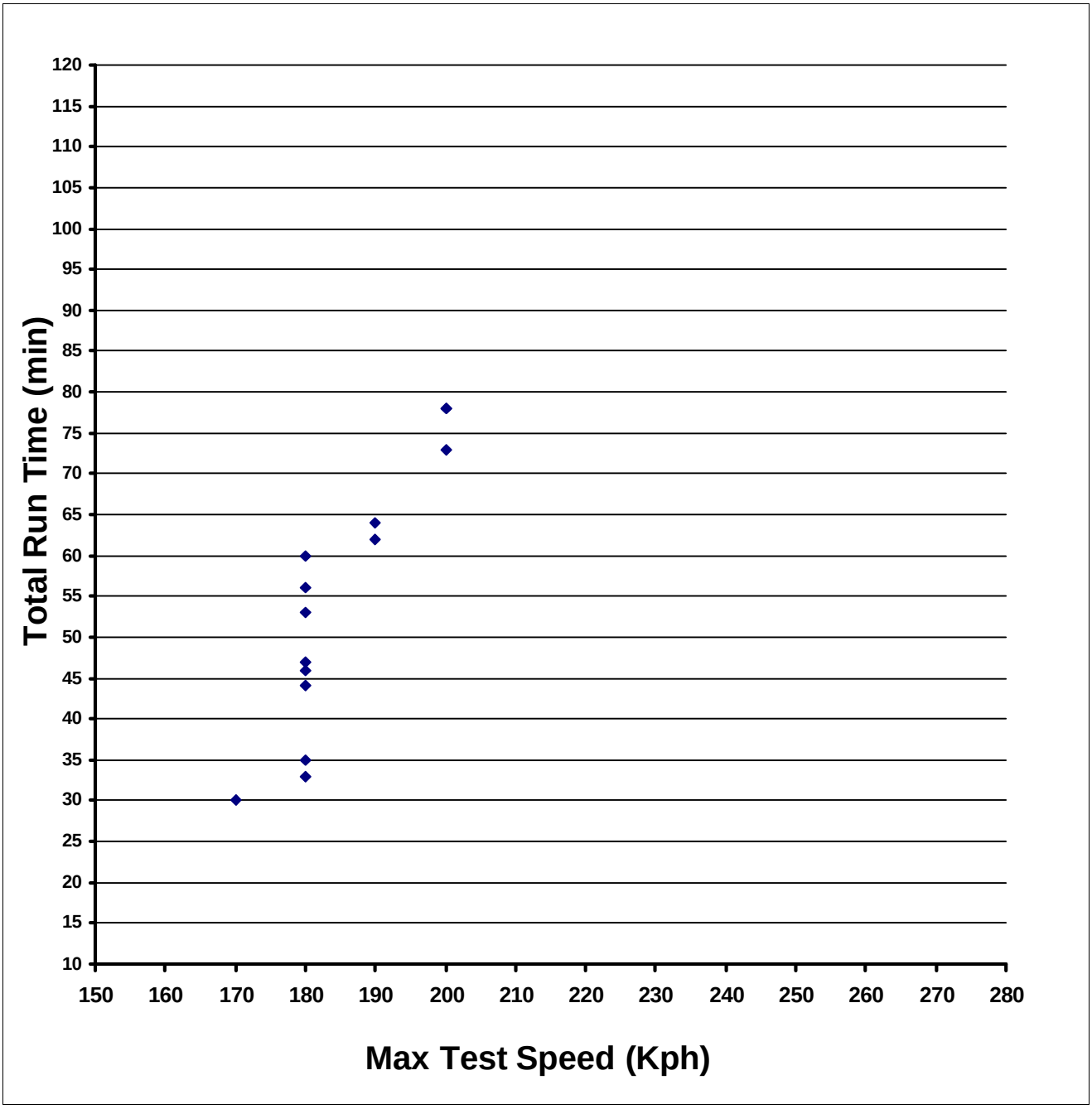
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	200	10	80
	200	7	77
	200	4	74
	200	1	71
	190	8	68
	190	5	65
	190	4	64
	190	4	64
	190	4	64
	190	3	63
	190	2	62
	190	2	62
	180	6	56
	180	4	54
Maximum:	**200**		**80**
Minimum:	**180**		**54**
Average:			**66**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-90-240-B-RMA

Size: P235/75R15 Speed: S Load (%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-90-240-B-RMA

Size: P235/75R15 Speed: S Load(%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

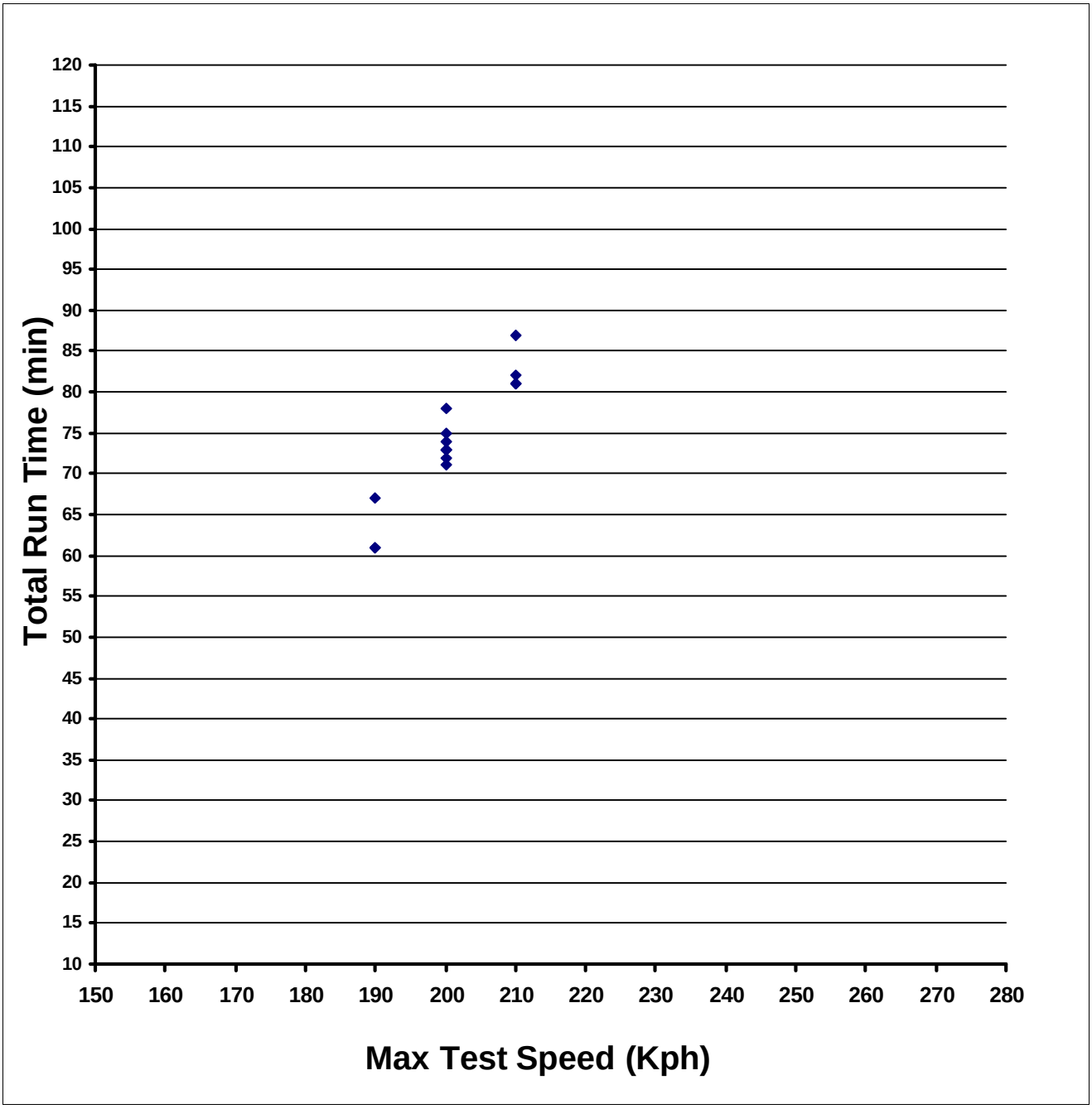
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	200	8	78
	200	8	78
	200	3	73
	190	4	64
	190	2	62
	180	30	60
	180	26	56
	180	23	53
	180	17	47
	180	16	46
	180	14	44
	180	5	35
	180	3	33
	170	10	30
Maximum:	**200**		**78**
Minimum:	**170**		**30**
Average:			**54.214**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-90-300-A-RMA

Size: P235/75R15 Speed: S Load (%) 90 Inflation(kPa): 300

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-90-300-A-RMA

Size: P235/75R15 **Speed: S** **Load(%) 90** **Inflation(kPa): 300**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

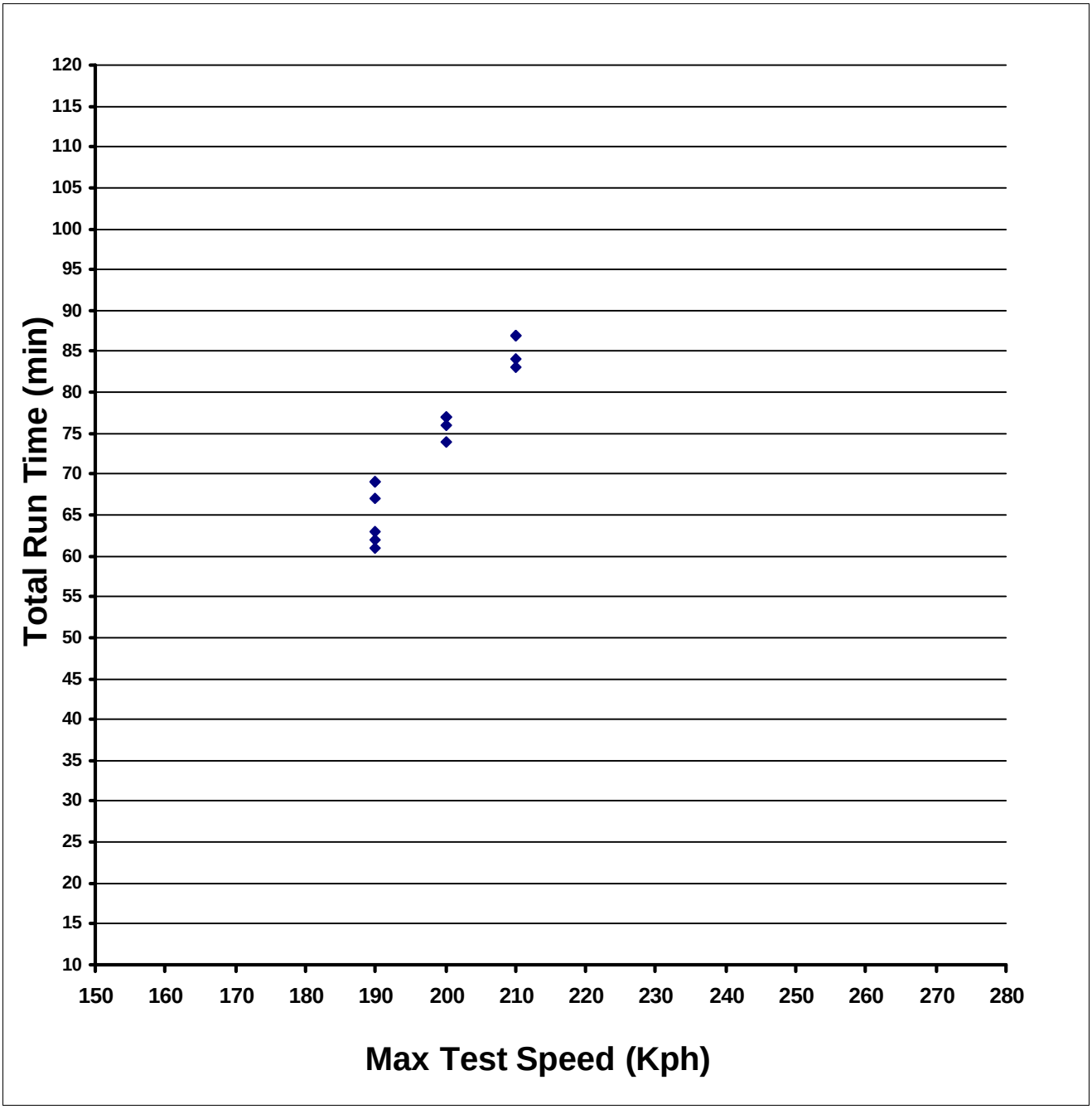
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	7	87
	210	2	82
	210	1	81
	210	1	81
	200	8	78
	200	5	75
	200	4	74
	200	3	73
	200	3	73
	200	2	72
	200	1	71
	190	7	67
	190	1	61
	190	1	61
Maximum:	**210**		**87**
Minimum:	**190**		**61**
Average:			**74**

Passenger High Speed Test Results

Page 1 for Test ID P235/75R15-S-90-300-B-RMA

Size: P235/75R15 Speed: S Load (%) 90 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



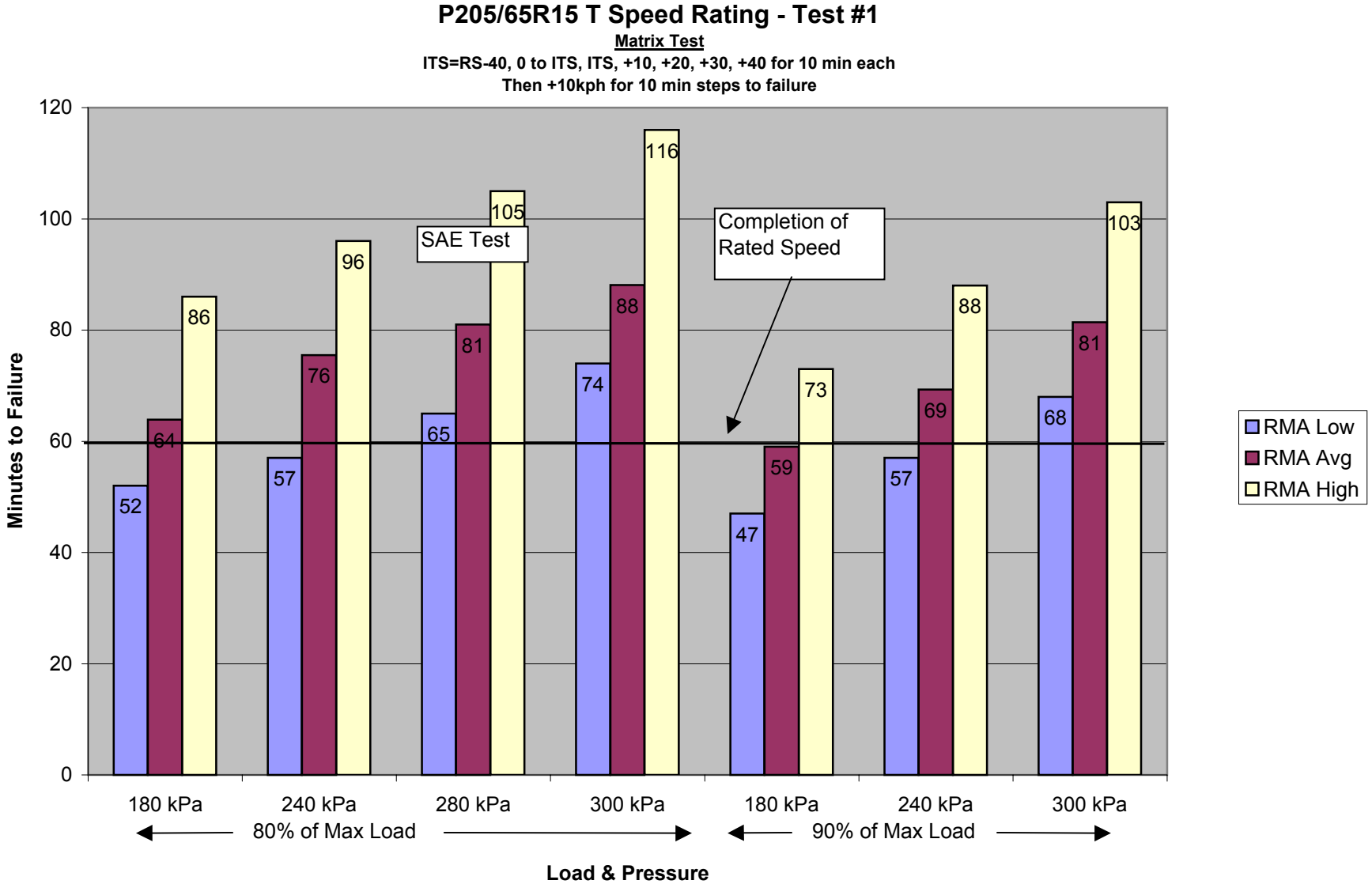
Passenger High Speed Test Results

Page 2 for Test ID: P235/75R15-S-90-300-B-RMA

Size: P235/75R15 Speed: S Load(%) 90 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

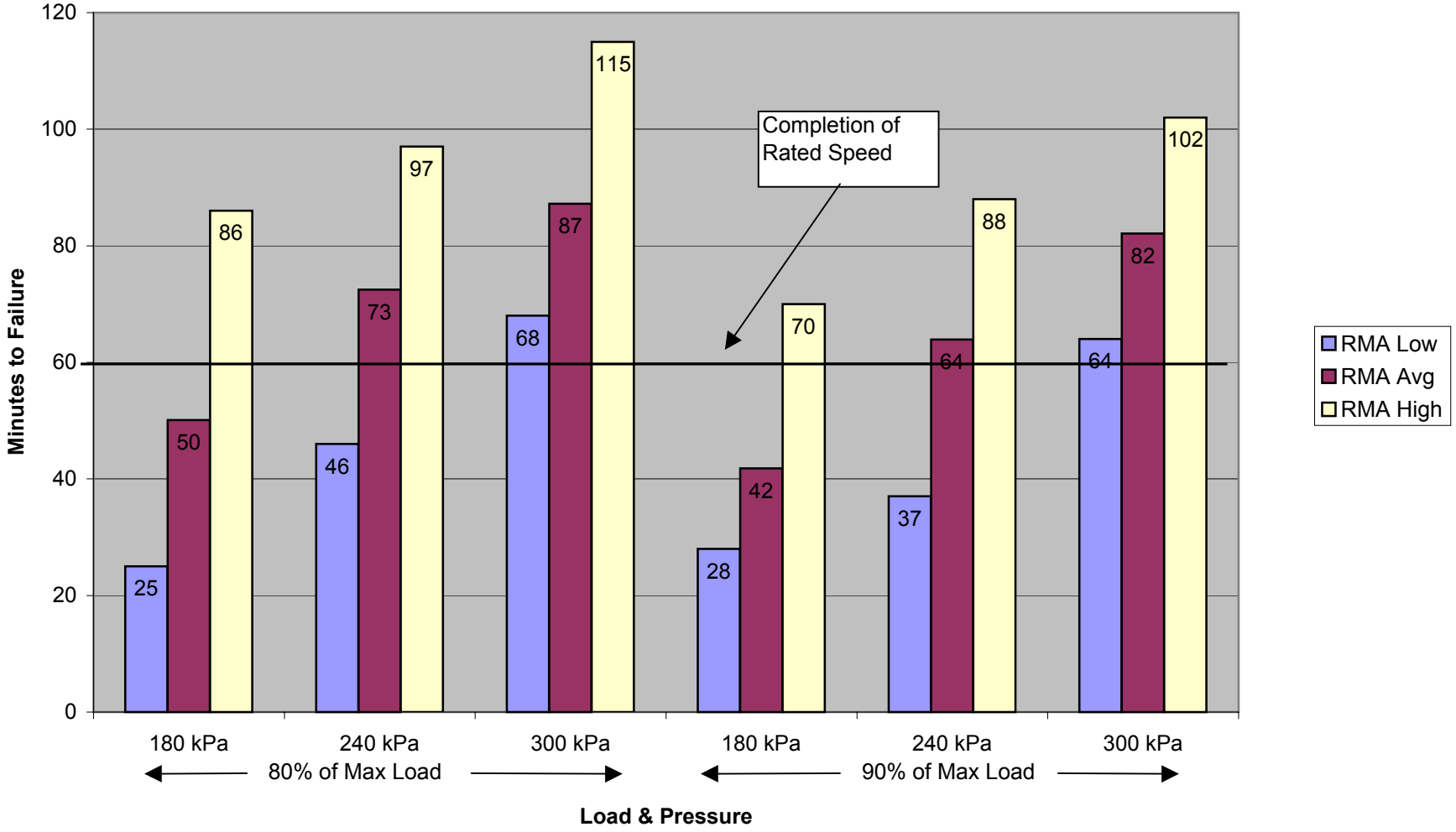
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	7	87
	210	7	87
	210	4	84
	210	3	83
	200	7	77
	200	7	77
	200	6	76
	200	4	74
	190	9	69
	190	9	69
	190	7	67
	190	3	63
	190	2	62
	190	1	61
Maximum:	**210**		**87**
Minimum:	**190**		**61**
Average:			**74**

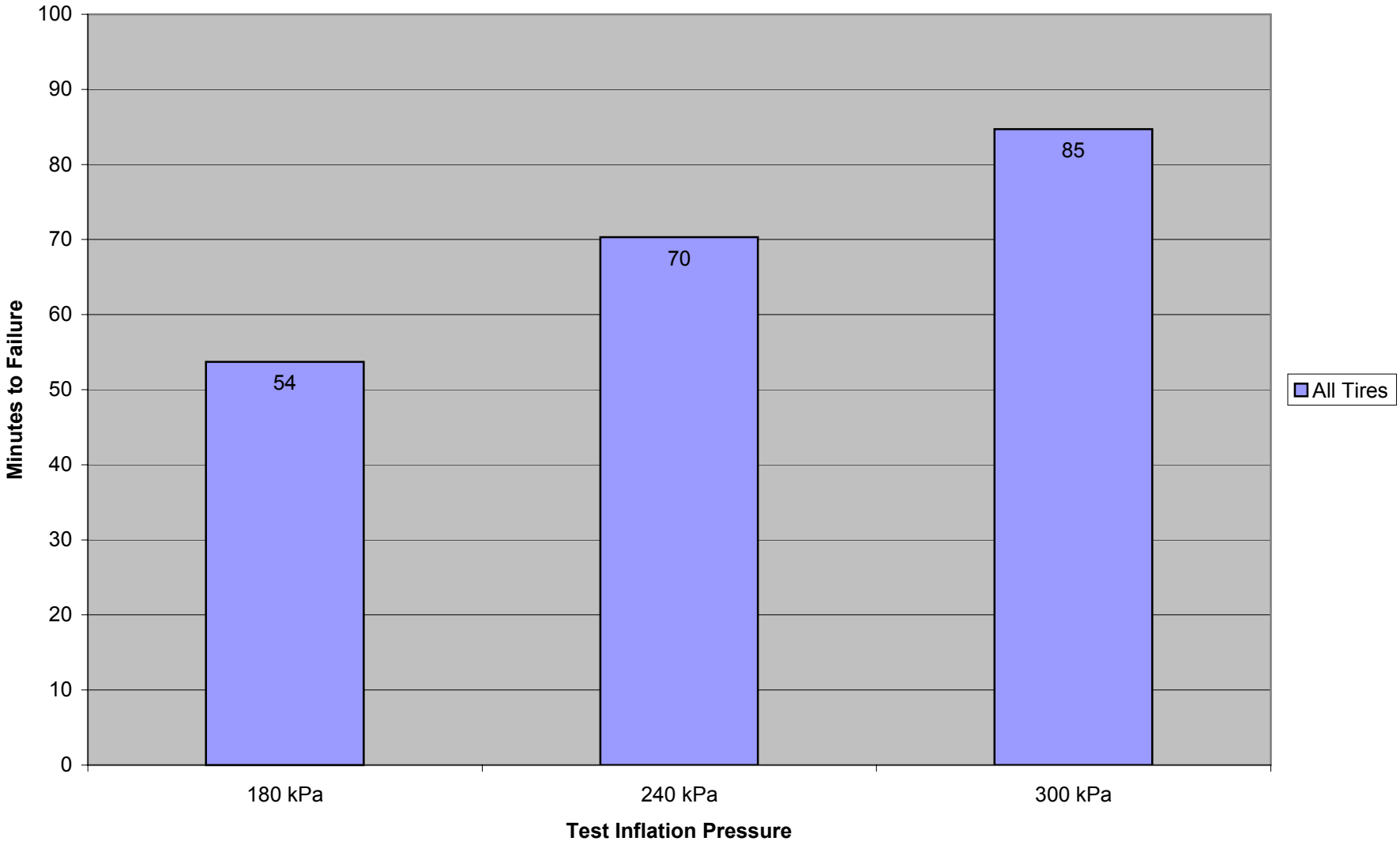

P205/65R15 T Speed Rating - Test #1
Matrix Test
ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each
Then +10kph for 10 min steps to failure
Minutes to Failure
120
100
80
60
40
20
0
SAE Test
Completion of Rated Speed
52
64
86
57
76
96
65
81
105
74
88
116
47
59
73
57
69
88
68
81
103
180 kPa
240 kPa
280 kPa
300 kPa
180 kPa
240 kPa
300 kPa
80% of Max Load
90% of Max Load
Load & Pressure
RMA Low
RMA Avg
RMA High

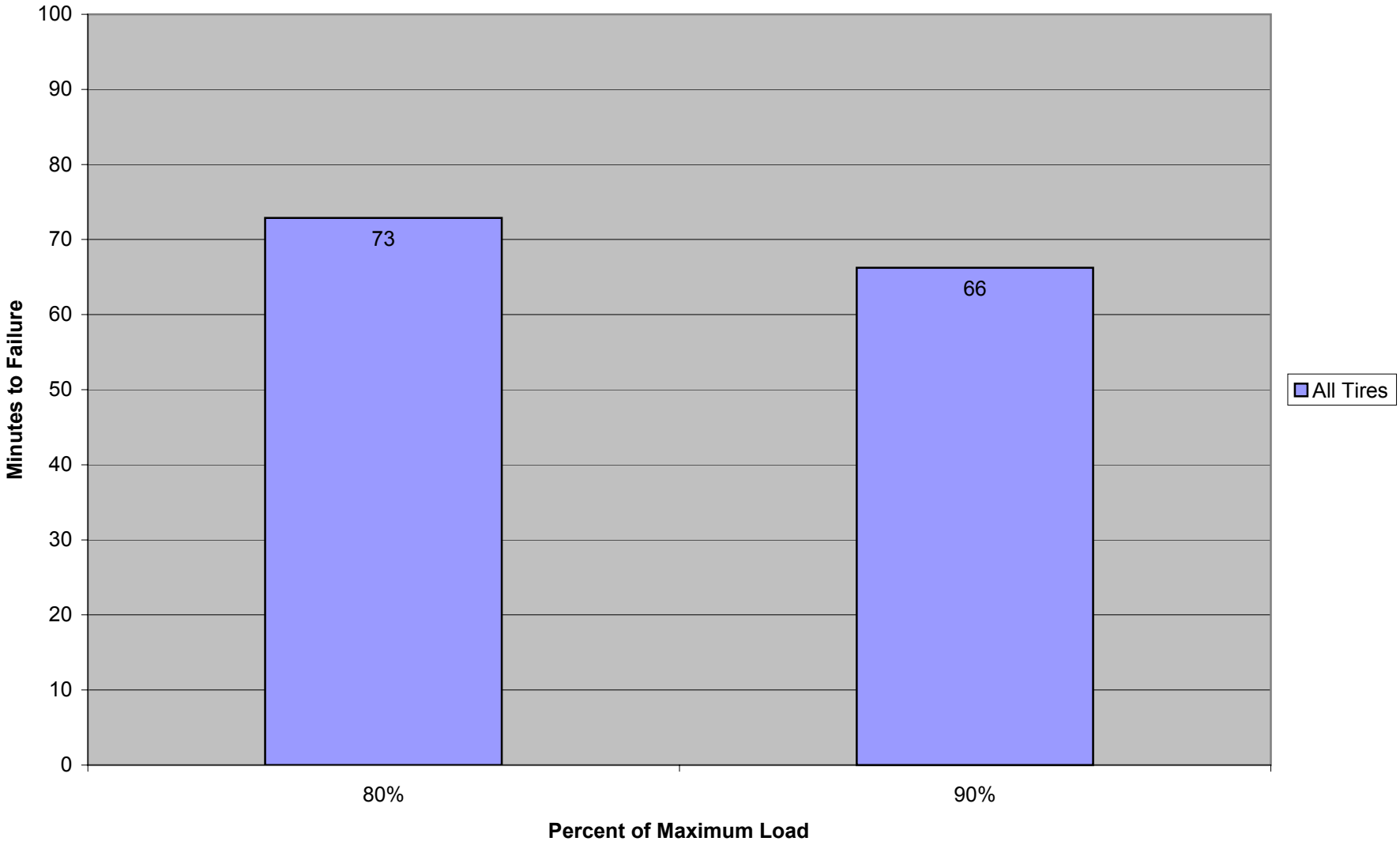
P205/65R15 T Speed Rating - Test #2

Matrix Test

ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure




Passenger High Speed - P205/65R15 T - Pressure Effect
Minutes to Failure
100
90
80
70
60
50
40
30
20
10
0
54
70
85
180 kPa
240 kPa
300 kPa
Test Inflation Pressure
All Tires

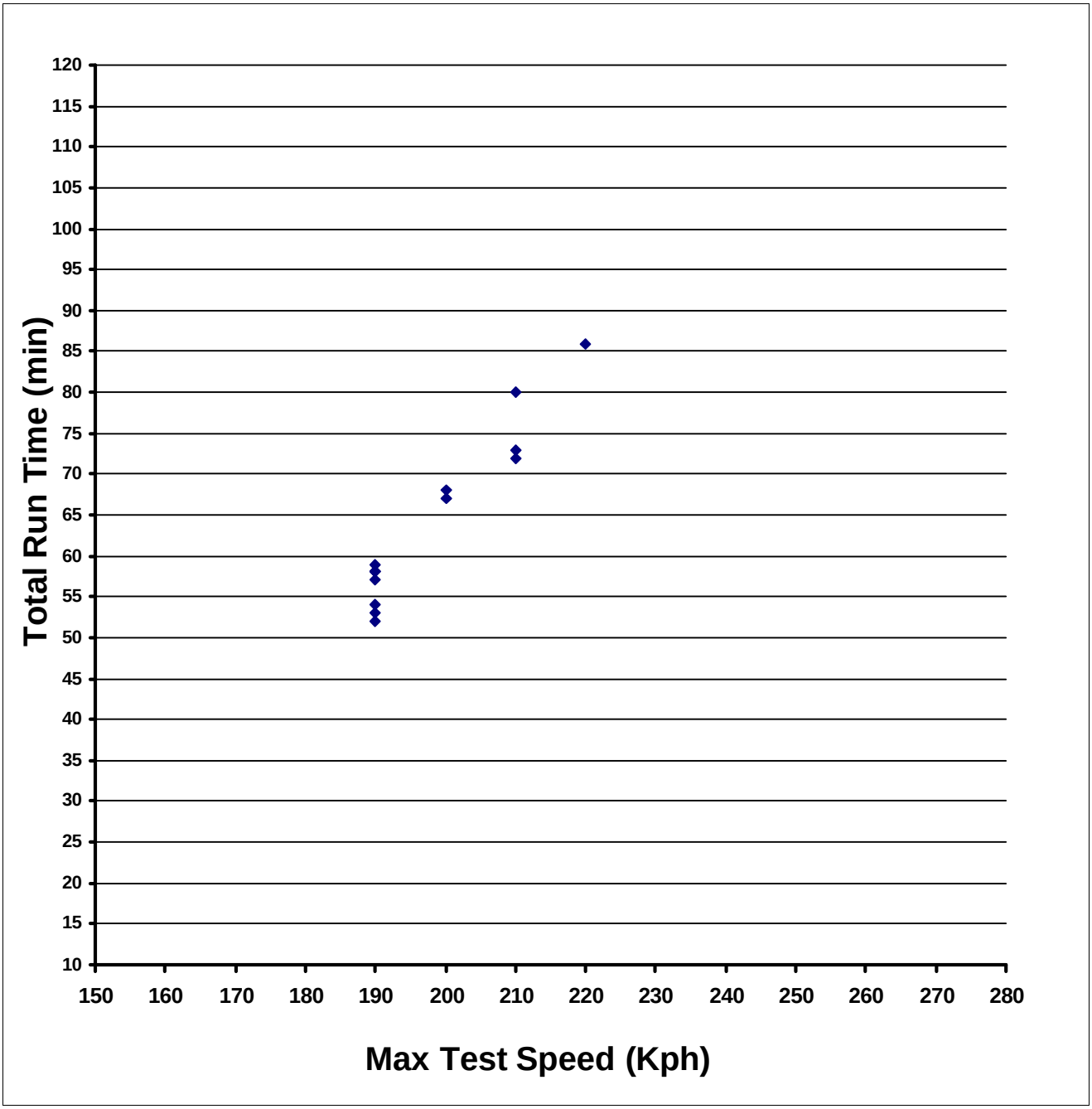

Passenger High Speed - P205/65R15 T - Load Effect
100
90
80
70
60
50
40
30
20
10
0
Minutes to Failure
73
66
80%
90%
Percent of Maximum Load
All Tires

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-80-180-A-RMA

Size: P205/65R15 Speed: T Load (%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-80-180-A-RMA

Size: P205/65R15 Speed: T Load(%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

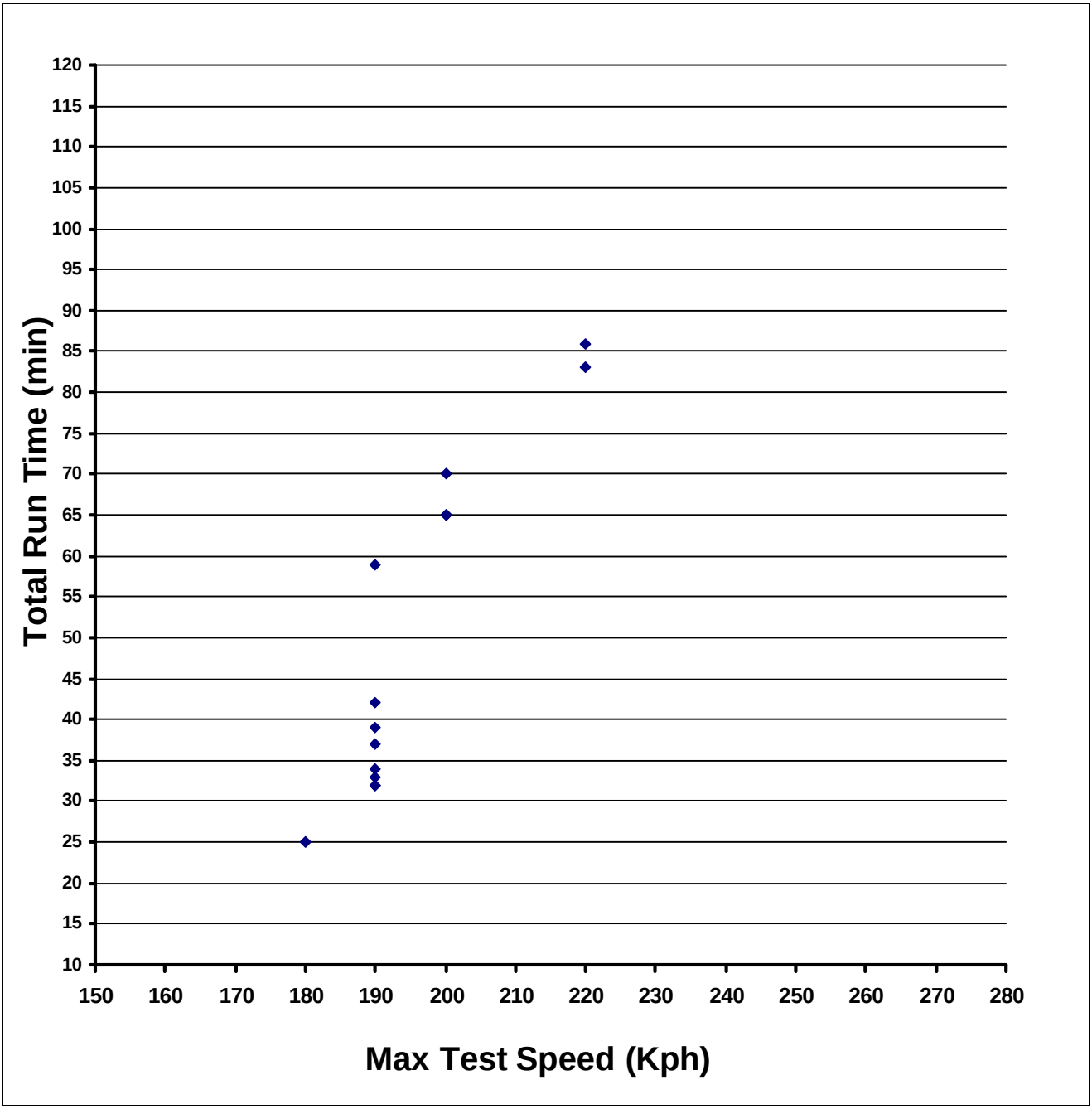
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	6	86
	210	10	80
	210	3	73
	210	2	72
	200	8	68
	200	7	67
	190	9	59
	190	8	58
	190	8	58
	190	8	58
	190	7	57
	190	4	54
	190	3	53
	190	2	52
Maximum:	**220**		**86**
Minimum:	**190**		**52**
Average:			**63.929**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-80-180-B-RMA

Size: P205/65R15 Speed: T Load (%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-80-180-B-RMA

Size: P205/65R15 Speed: T Load(%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

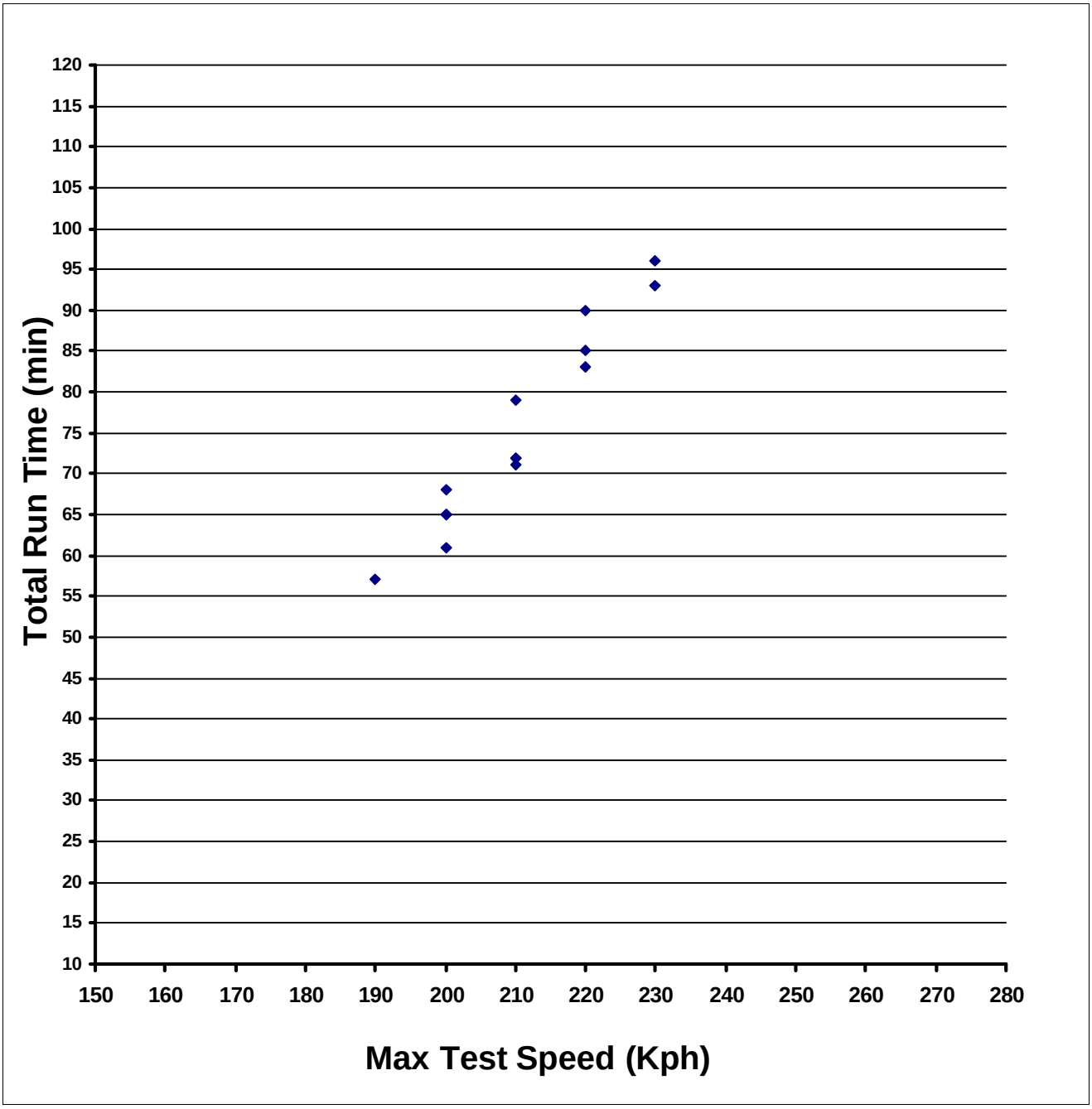
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	6	86
	220	3	83
	200	10	70
	200	5	65
	200	5	65
	190	29	59
	190	12	42
	190	9	39
	190	7	37
	190	4	34
	190	3	33
	190	2	32
	190	2	32
	180	5	25
Maximum:	**220**		**86**
Minimum:	**180**		**25**
Average:			**50.143**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-80-240-A-RMA

Size: P205/65R15 Speed: T Load (%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-80-240-A-RMA

Size: P205/65R15 Speed: T Load(%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

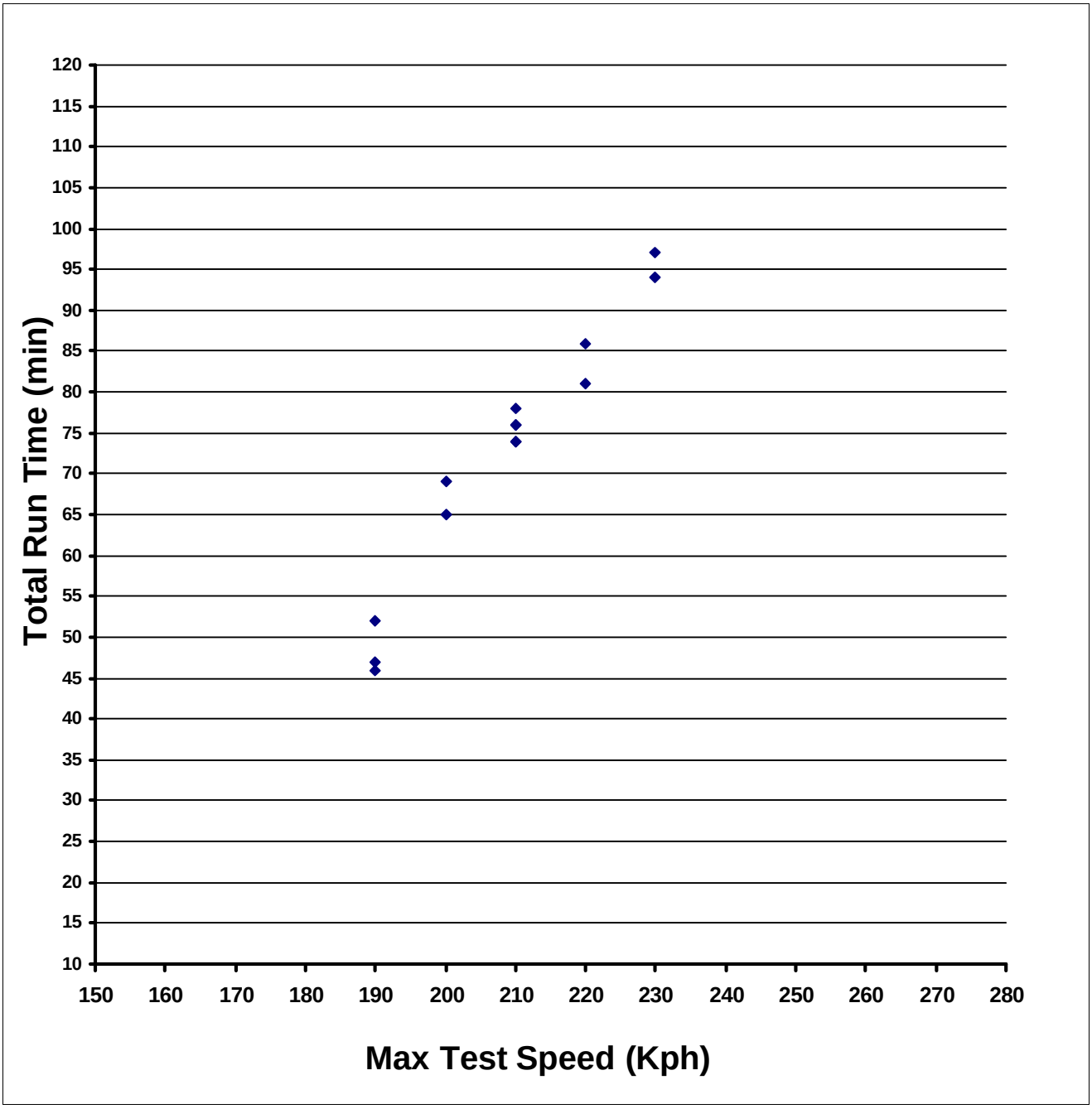
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	230	6	96
	230	3	93
	220	10	90
	220	5	85
	220	3	83
	210	9	79
	210	2	72
	210	2	72
	210	1	71
	200	8	68
	200	5	65
	200	5	65
	200	1	61
	190	7	57
Maximum:	**230**		**96**
Minimum:	**190**		**57**
Average:			**75.5**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-80-240-B-RMA

Size: P205/65R15 Speed: T Load (%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-80-240-B-RMA

Size: P205/65R15 Speed: T Load(%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

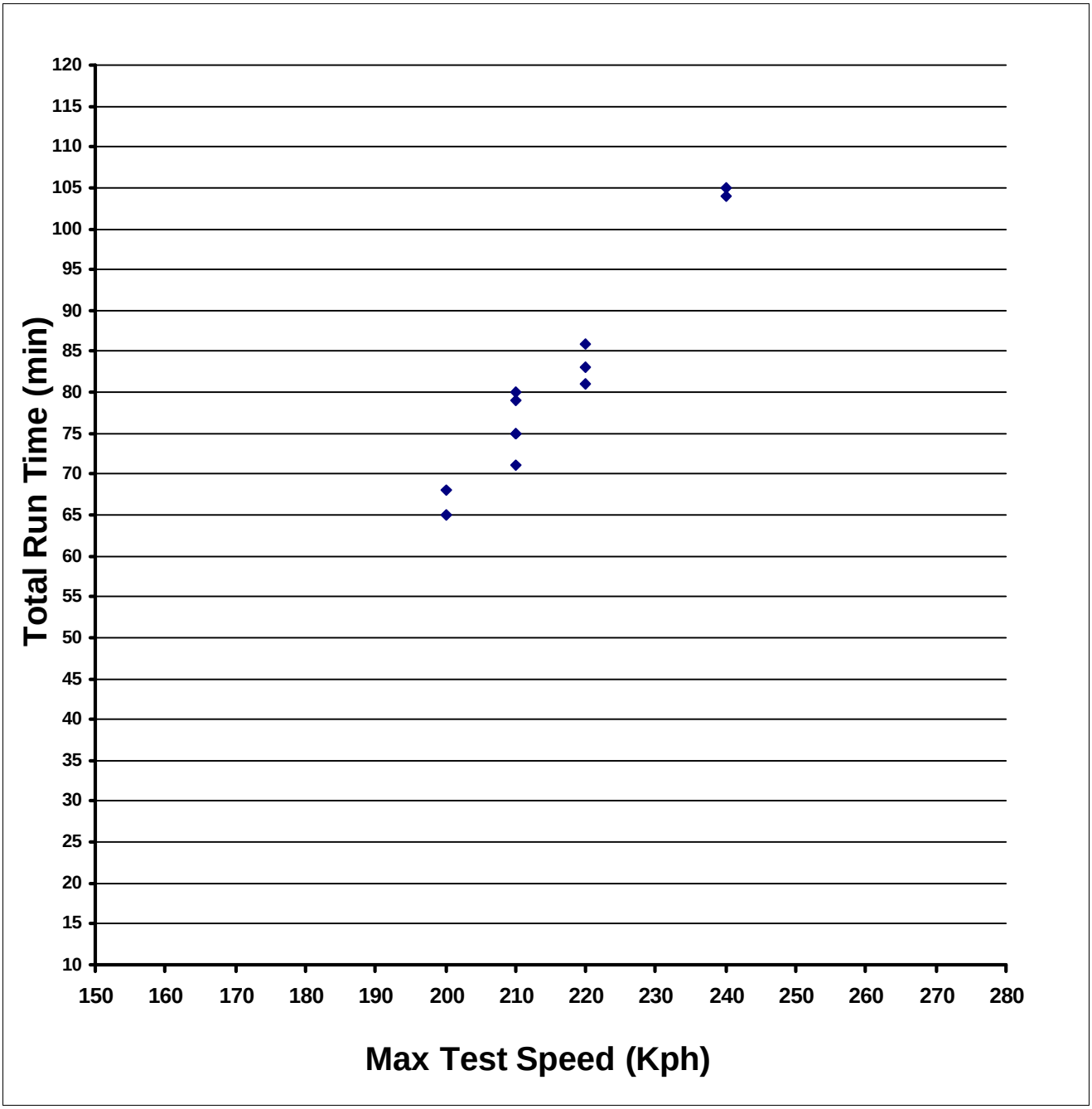
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	230	7	97
	230	4	94
	220	6	86
	220	1	81
	210	8	78
	210	6	76
	210	6	76
	210	4	74
	210	4	74
	200	9	69
	200	5	65
	190	22	52
	190	17	47
	190	16	46
Maximum:	**230**		**97**
Minimum:	**190**		**46**
Average:			**72.5**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-80-280-A-SAE J1561

Size: P205/65R15 Speed: T Load (%) 80 Inflation(kPa): 280

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-80-280-A-SAE J1561

Size: P205/65R15 Speed: T Load(%) 80 Inflation(kPa): 280

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

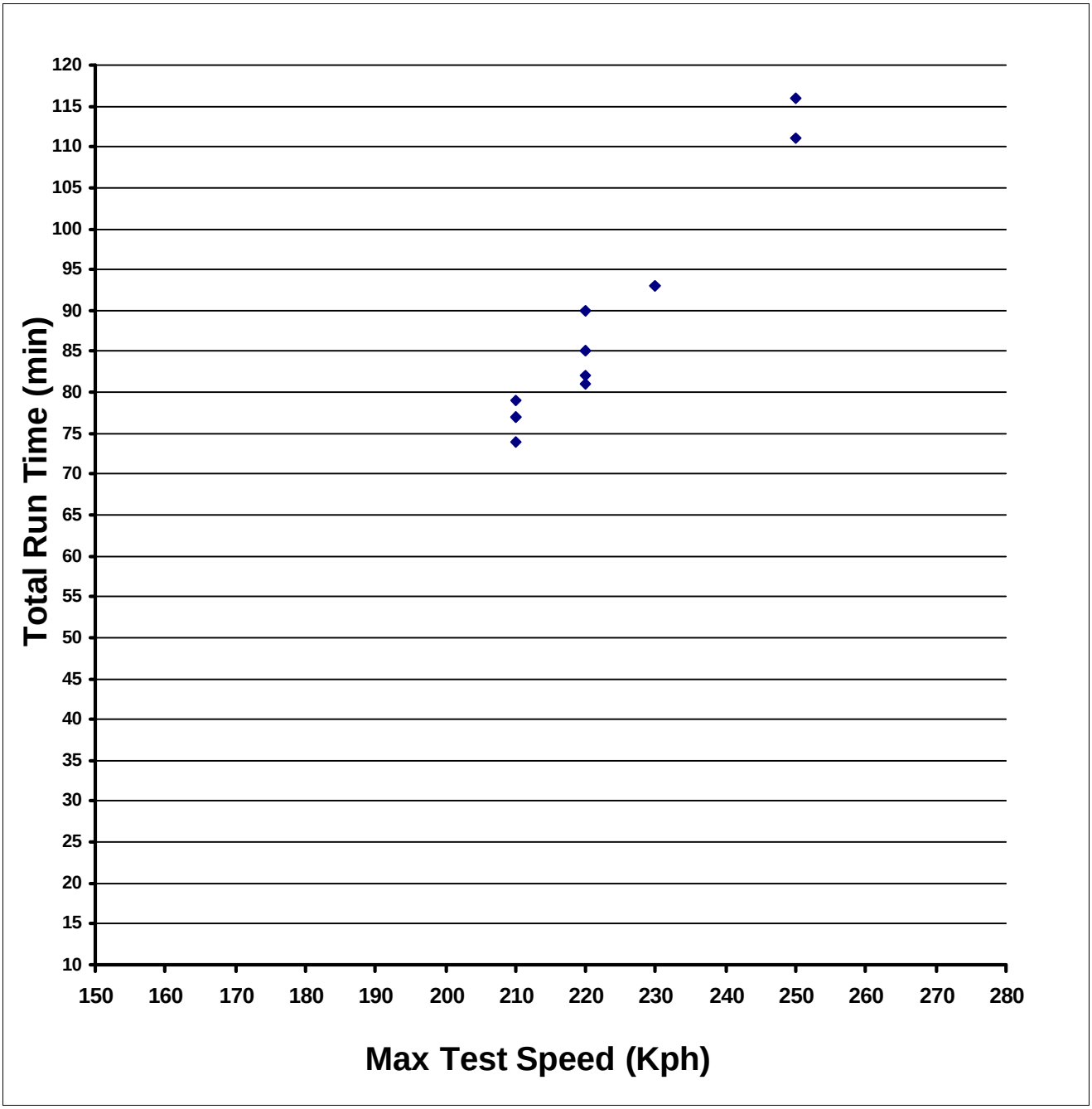
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	240	5	105
	240	4	104
	220	6	86
	220	3	83
	220	1	81
	210	10	80
	210	9	79
	210	5	75
	210	5	75
	210	1	71
	200	8	68
	200	5	65
Maximum:	**240**		**105**
Minimum:	**200**		**65**
Average:			**81**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-80-300-A-RMA

Size: P205/65R15 Speed: T Load (%) 80 Inflation(kPa): 300

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-80-300-A-RMA

Size: P205/65R15 **Speed: T** **Load(%) 80** **Inflation(kPa): 300**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

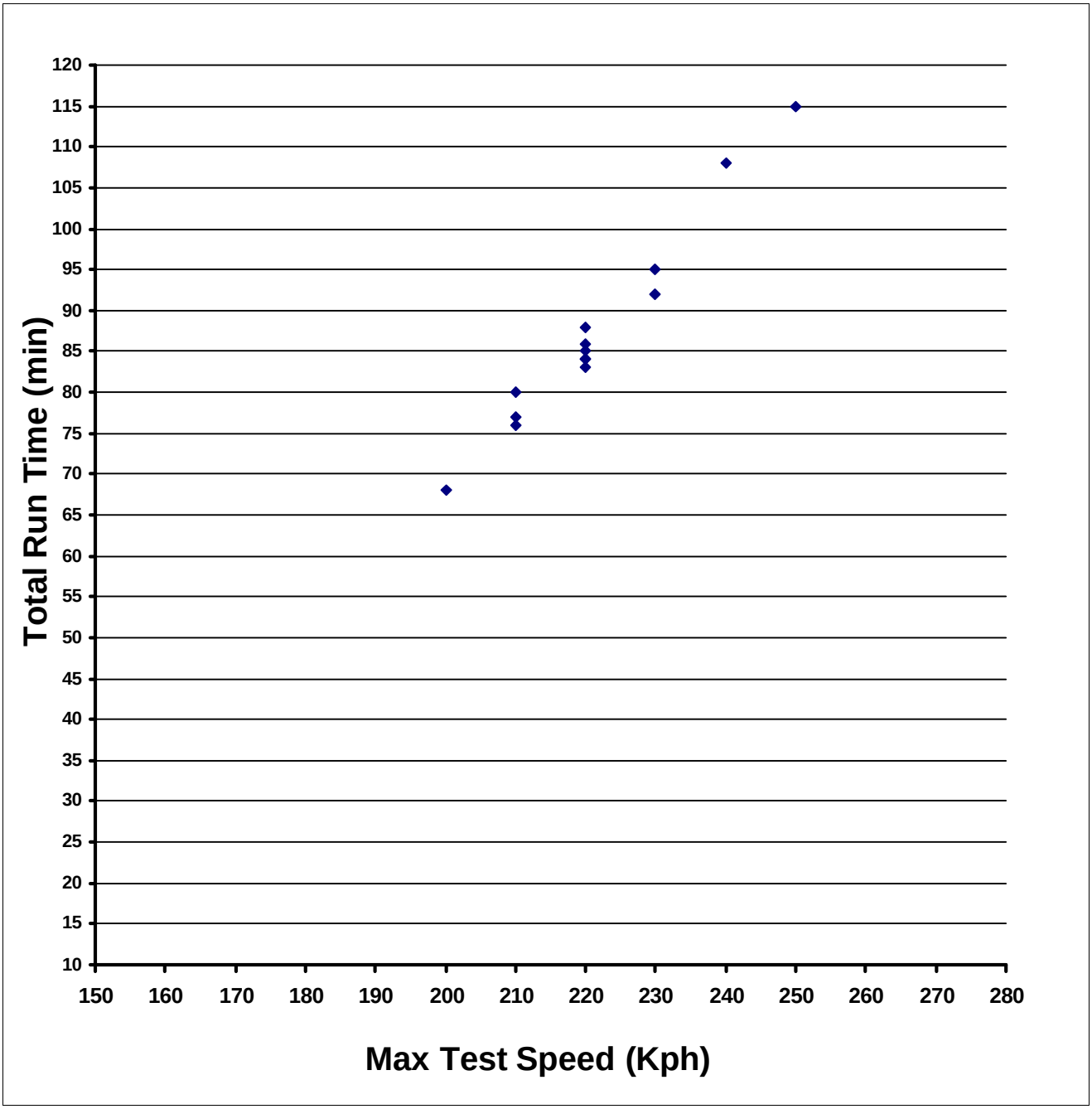
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	250	6	116
	250	1	111
	230	3	93
	230	3	93
	220	10	90
	220	10	90
	220	5	85
	220	5	85
	220	2	82
	220	1	81
	210	9	79
	210	7	77
	210	7	77
	210	4	74
Maximum:	**250**		**116**
Minimum:	**210**		**74**
Average:			**88.071**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-80-300-B-RMA

Size: P205/65R15 Speed: T Load (%) 80 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-80-300-B-RMA

Size: P205/65R15 Speed: T Load(%) 80 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

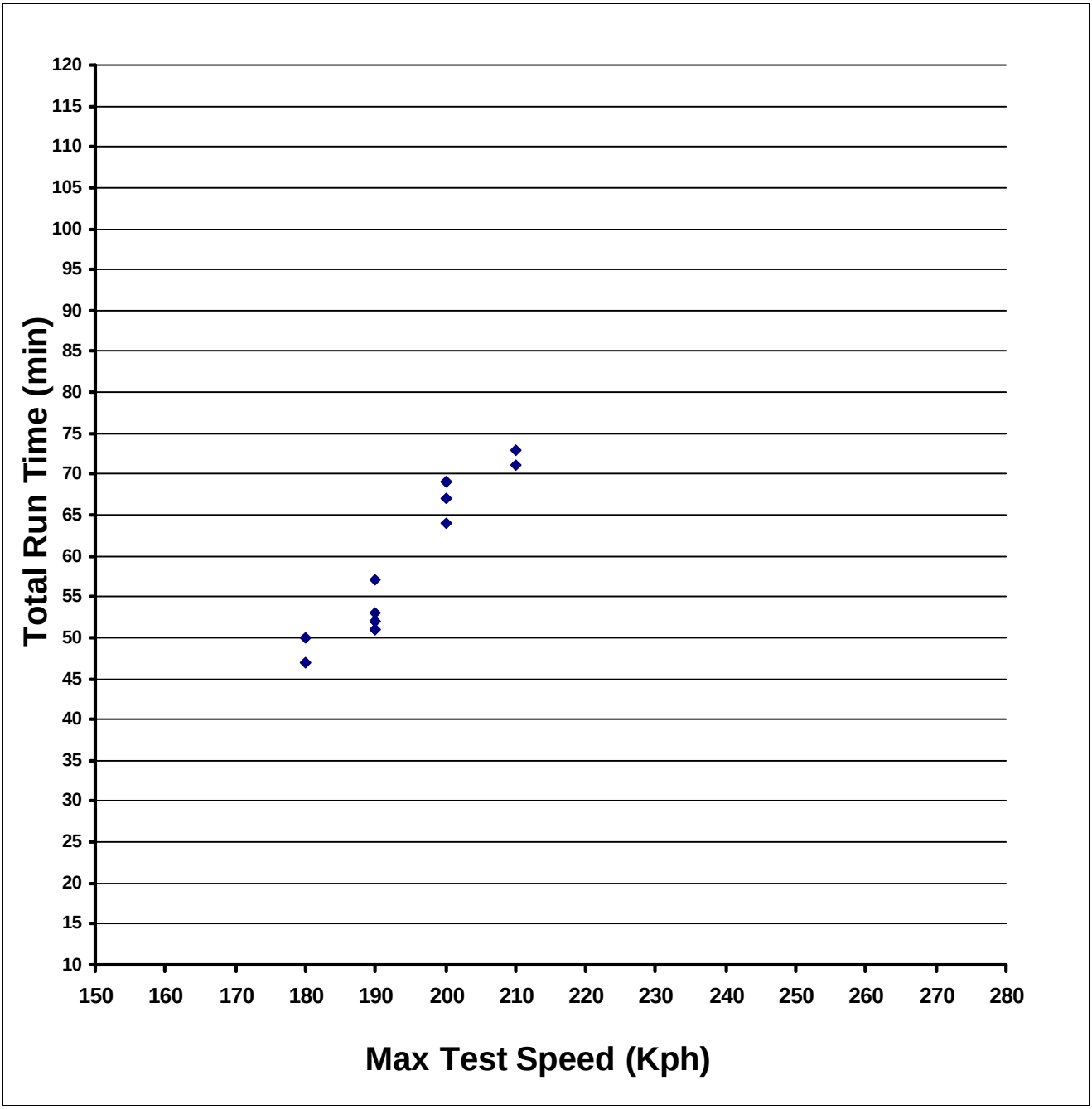
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	250	5	115
	240	8	108
	230	5	95
	230	2	92
	220	8	88
	220	6	86
	220	5	85
	220	4	84
	220	4	84
	220	3	83
	210	10	80
	210	7	77
	210	6	76
	200	8	68
Maximum:	**250**		**115**
Minimum:	**200**		**68**
Average:			**87.214**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-90-180-A-RMA

Size: P205/65R15 Speed: T Load (%) 90 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-90-180-A-RMA

Size: P205/65R15 Speed: T Load(%) 90 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

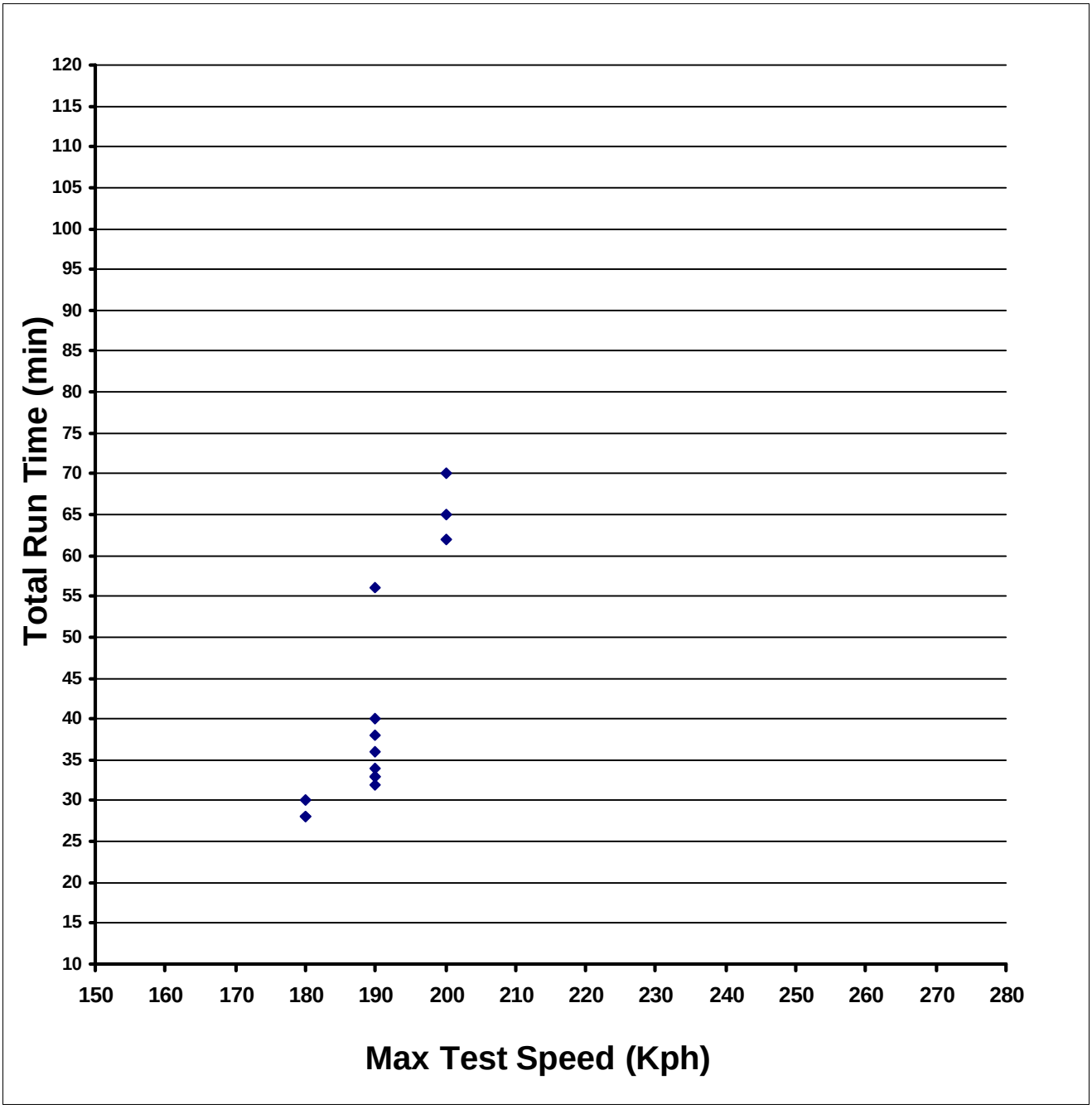
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	3	73
	210	1	71
	200	9	69
	200	9	69
	200	7	67
	200	4	64
	190	7	57
	190	3	53
	190	2	52
	190	2	52
	190	1	51
	190	1	51
	180	10	50
	180	7	47
Maximum:	**210**		**73**
Minimum:	**180**		**47**
Average:			**59**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-90-180-B-RMA

Size: P205/65R15 Speed: T Load (%) 90 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-90-180-B-RMA

Size: P205/65R15 Speed: T Load(%) 90 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

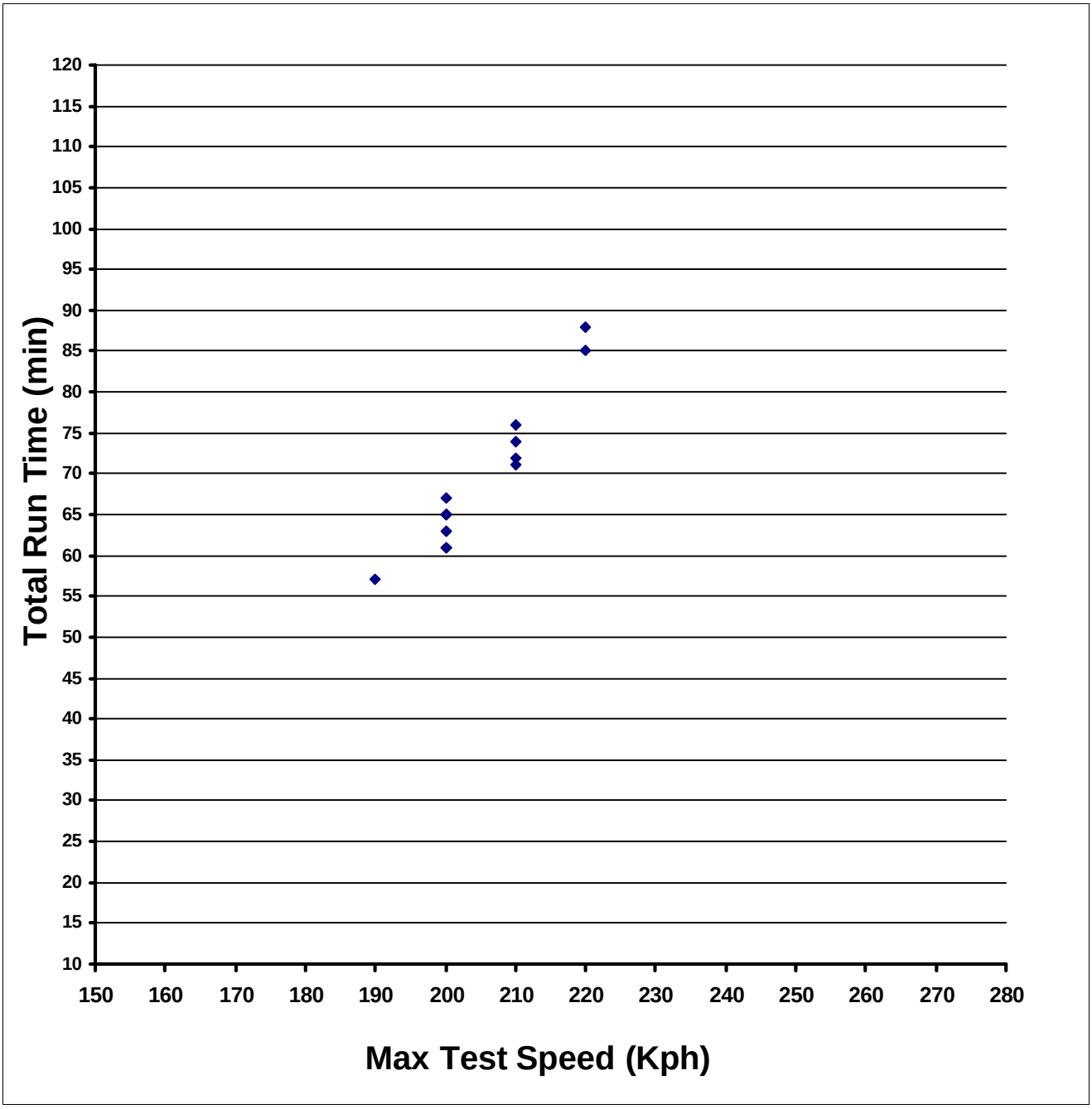
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	200	10	70
	200	5	65
	200	2	62
	190	26	56
	190	10	40
	190	8	38
	190	6	36
	190	4	34
	190	3	33
	190	3	33
	190	2	32
	180	10	30
	180	8	28
	180	8	28
Maximum:	**200**		**70**
Minimum:	**180**		**28**
Average:			**41.786**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-90-240-A-RMA

Size: P205/65R15 Speed: T Load (%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-90-240-A-RMA

Size: P205/65R15 **Speed: T** **Load(%) 90** **Inflation(kPa): 240**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

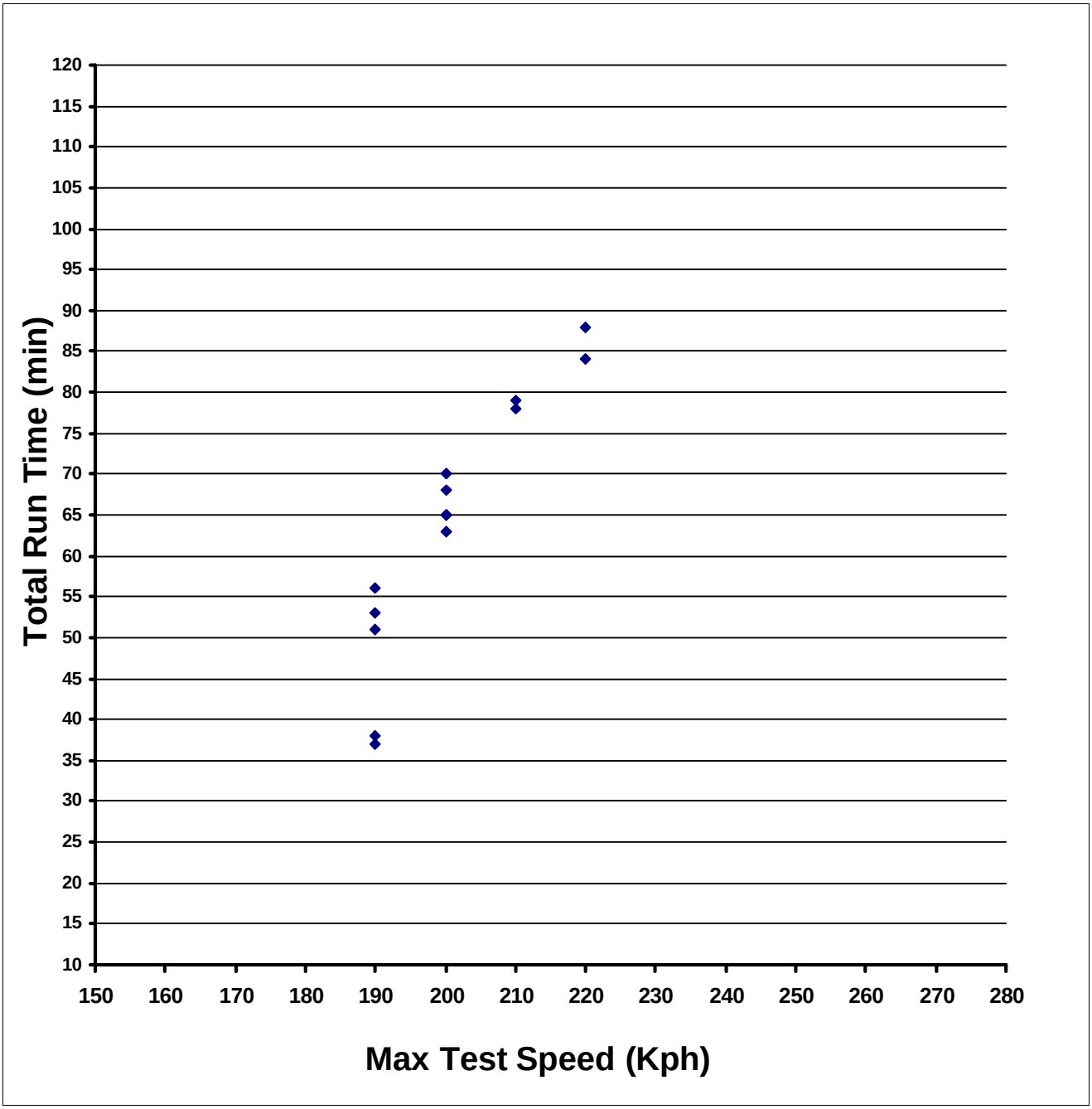
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	8	88
	220	5	85
	210	6	76
	210	4	74
	210	2	72
	210	1	71
	200	7	67
	200	5	65
	200	5	65
	200	5	65
	200	3	63
	200	1	61
	200	1	61
	190	7	57
Maximum:	**220**		**88**
Minimum:	**190**		**57**
Average:			**69.286**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-90-240-B-RMA

Size: P205/65R15 Speed: T Load (%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-90-240-B-RMA

Size: P205/65R15 Speed: T Load(%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

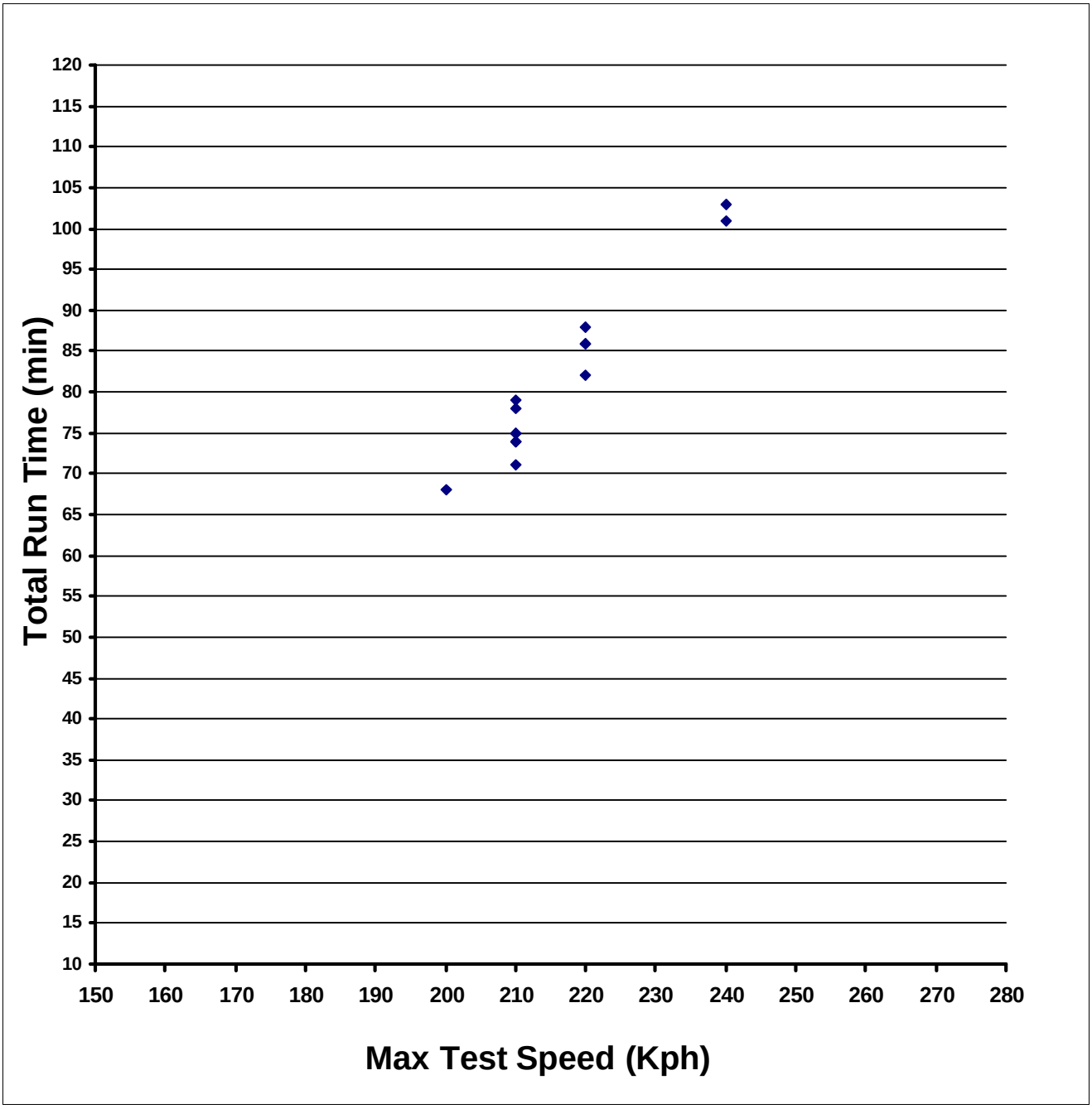
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	8	88
	220	4	84
	210	9	79
	210	8	78
	200	10	70
	200	8	68
	200	5	65
	200	5	65
	200	3	63
	190	26	56
	190	23	53
	190	21	51
	190	8	38
	190	7	37
Maximum:	**220**		**88**
Minimum:	**190**		**37**
Average:			**63.929**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-90-300-A-RMA

Size: P205/65R15 Speed: T Load (%) 90 Inflation(kPa): 300

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-90-300-A-RMA

Size: P205/65R15 Speed: T Load(%) 90 Inflation(kPa): 300

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

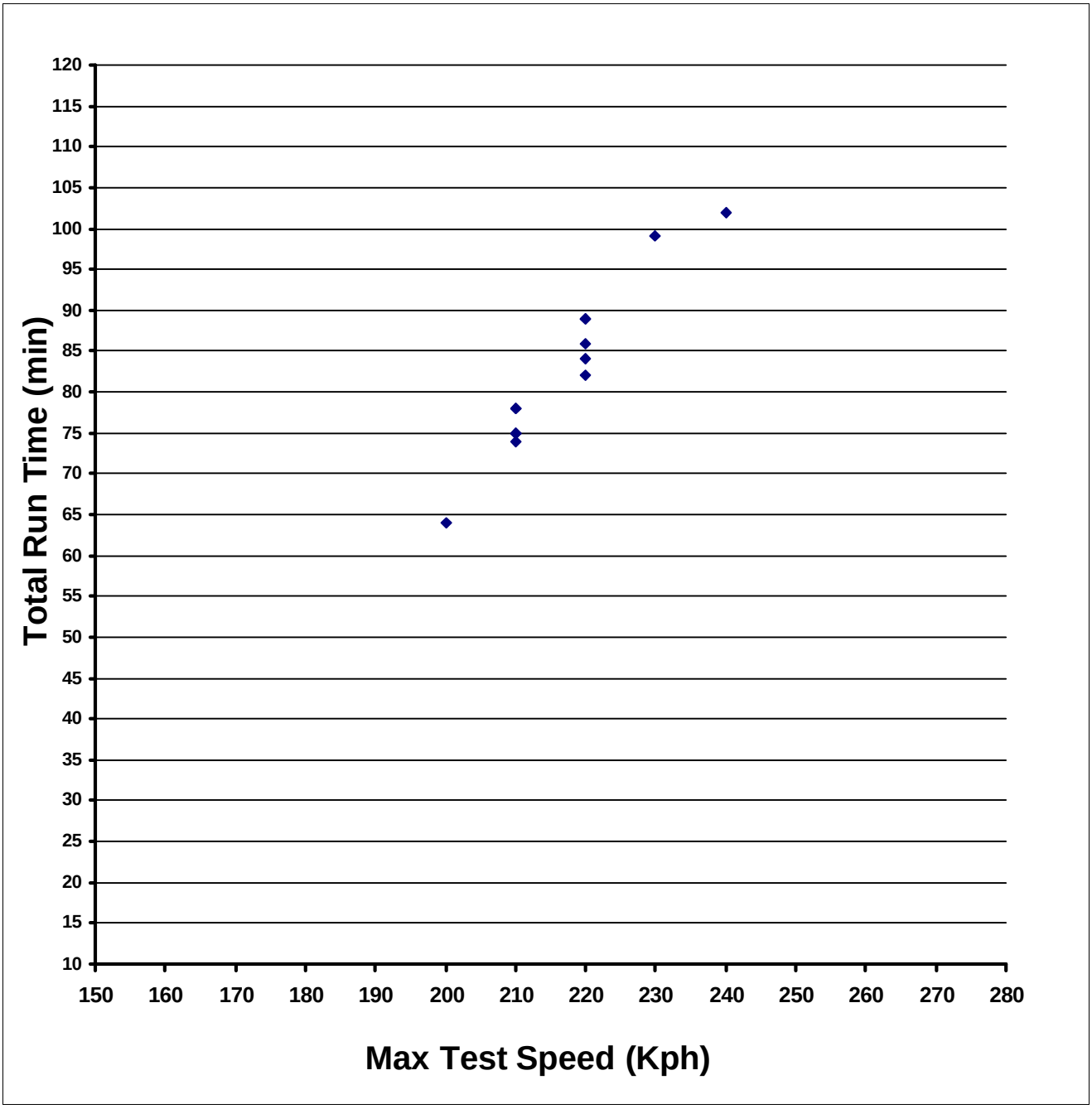
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	240	3	103
	240	1	101
	220	8	88
	220	6	86
	220	6	86
	220	2	82
	210	9	79
	210	8	78
	210	5	75
	210	5	75
	210	4	74
	210	4	74
	210	1	71
	200	8	68
Maximum:	**240**		**103**
Minimum:	**200**		**68**
Average:			**81.429**

Passenger High Speed Test Results

Page 1 for Test ID P205/65R15-T-90-300-B-RMA

Size: P205/65R15 Speed: T Load (%) 90 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P205/65R15-T-90-300-B-RMA

Size: P205/65R15 Speed: T Load(%) 90 Inflation(kPa): 300

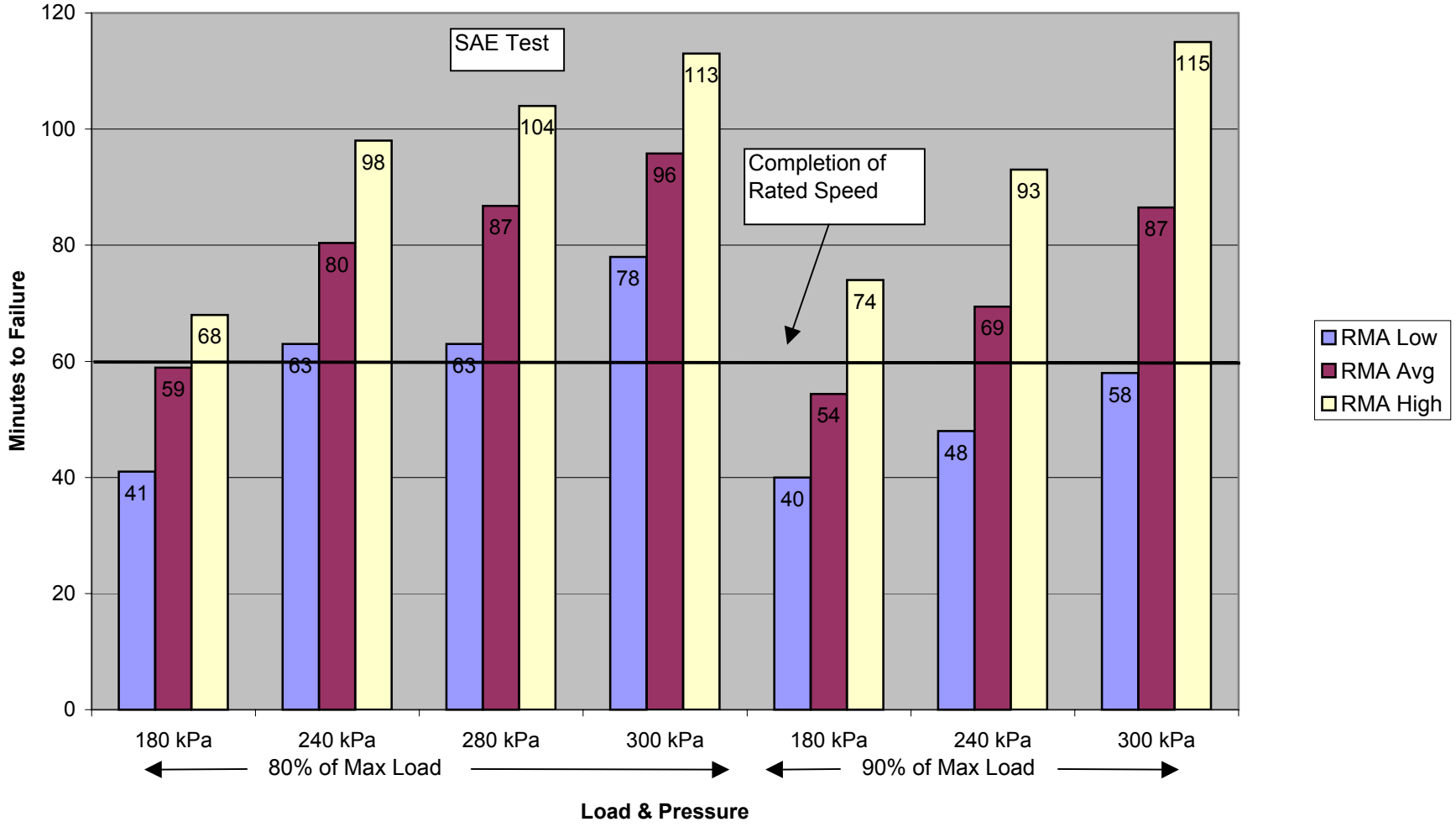
Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

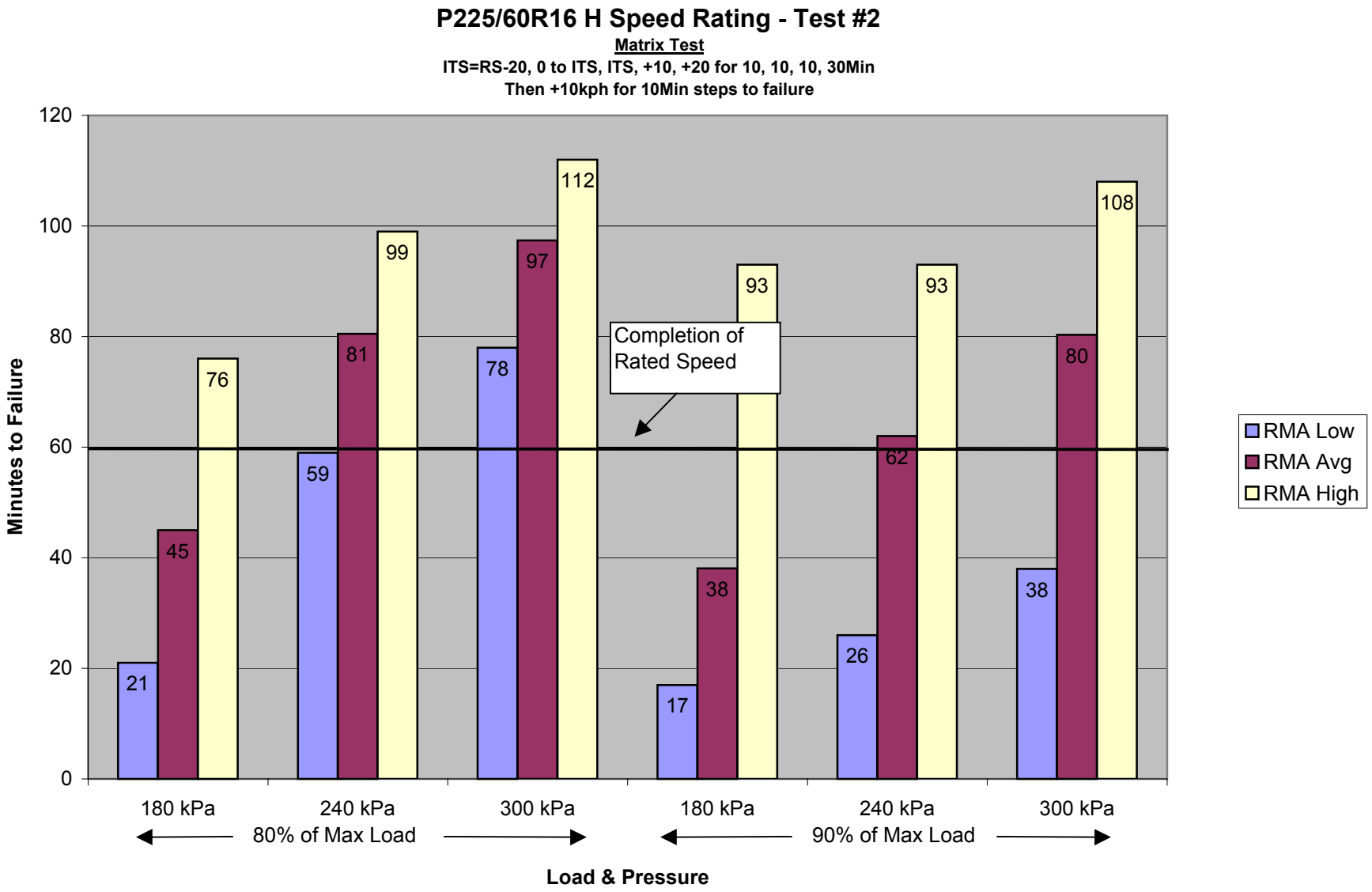
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	240	2	102
	230	9	99
	220	9	89
	220	9	89
	220	6	86
	220	4	84
	220	2	82
	210	8	78
	210	8	78
	210	5	75
	210	5	75
	210	5	75
	210	4	74
	200	4	64
Maximum:	**240**		**102**
Minimum:	**200**		**64**
Average:			**82.143**

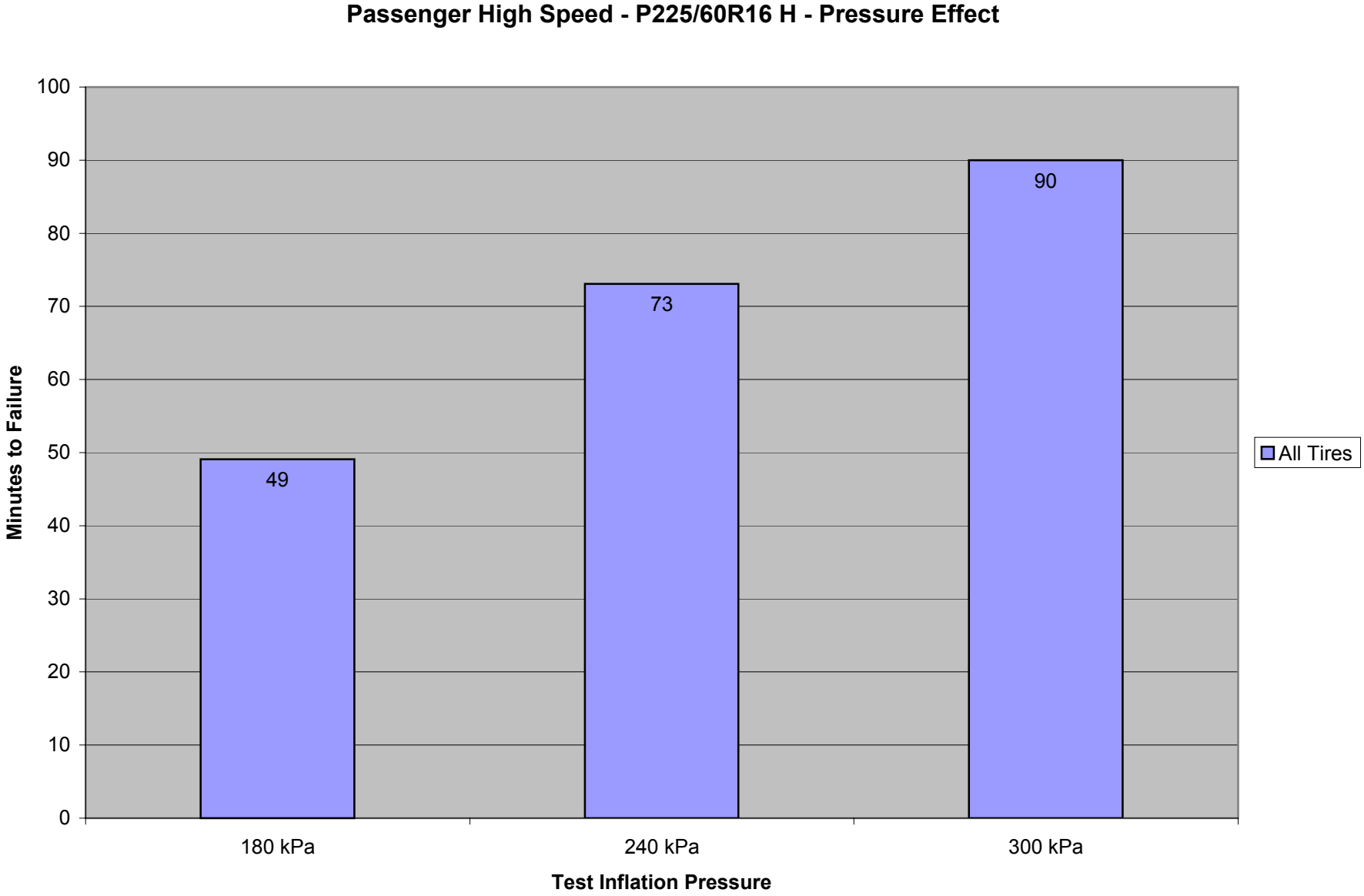
P225/60R16 H Speed Rating - Test #1

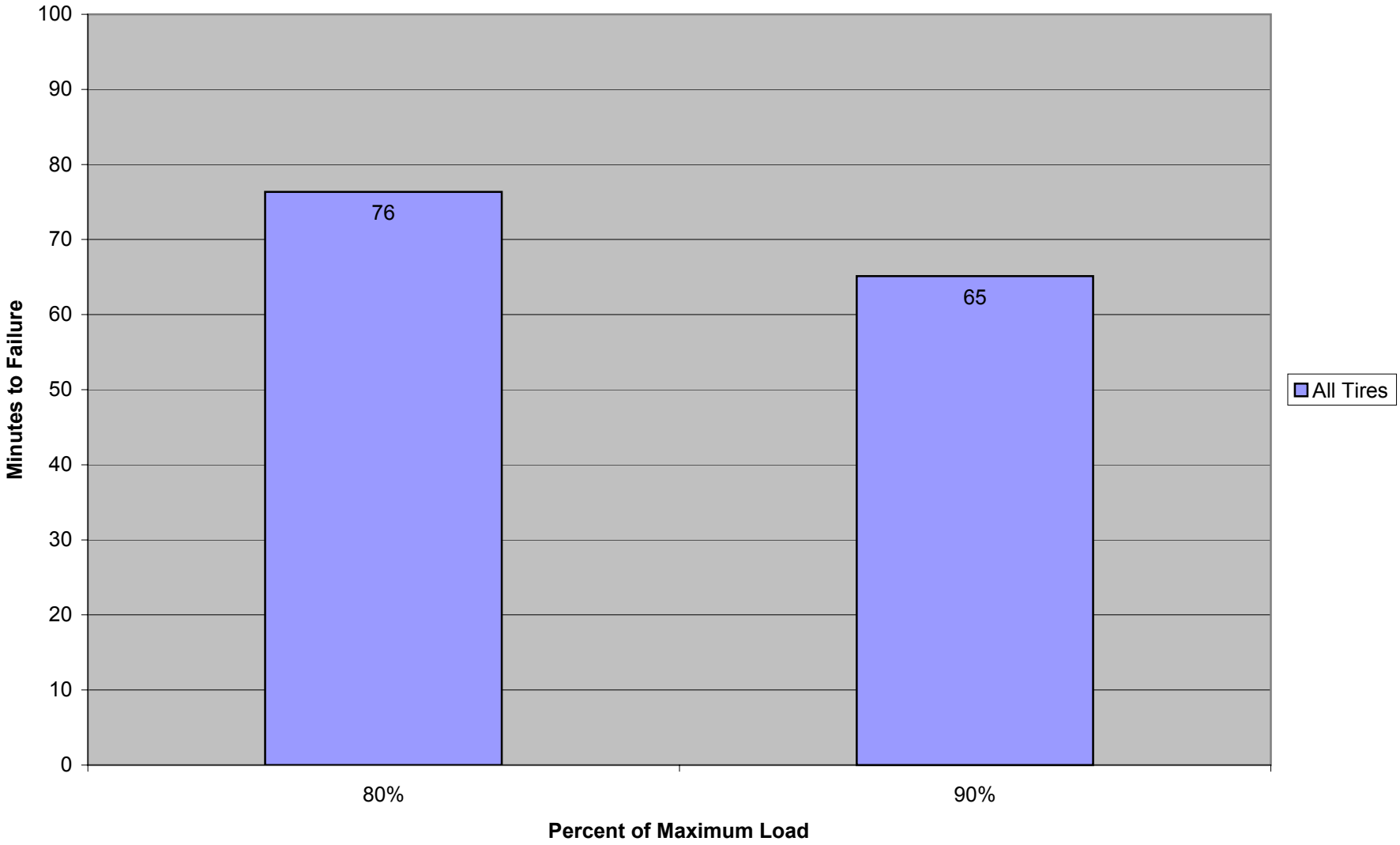
Matrix Test

ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each
Then +10kph for 10 min steps to failure




P225/60R16 H Speed Rating - Test #2
Matrix Test
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure
Minutes to Failure
120
100
80
60
40
20
0
Completion of Rated Speed
21
45
76
59
81
99
78
97
112
17
38
93
26
62
93
38
80
108
180 kPa
240 kPa
300 kPa
180 kPa
240 kPa
300 kPa
80% of Max Load
90% of Max Load
Load & Pressure
RMA Low
RMA Avg
RMA High


Passenger High Speed - P225/60R16 H - Pressure Effect
Minutes to Failure
100
90
80
70
60
50
40
30
20
10
0
49
73
90
180 kPa
240 kPa
300 kPa
Test Inflation Pressure
All Tires

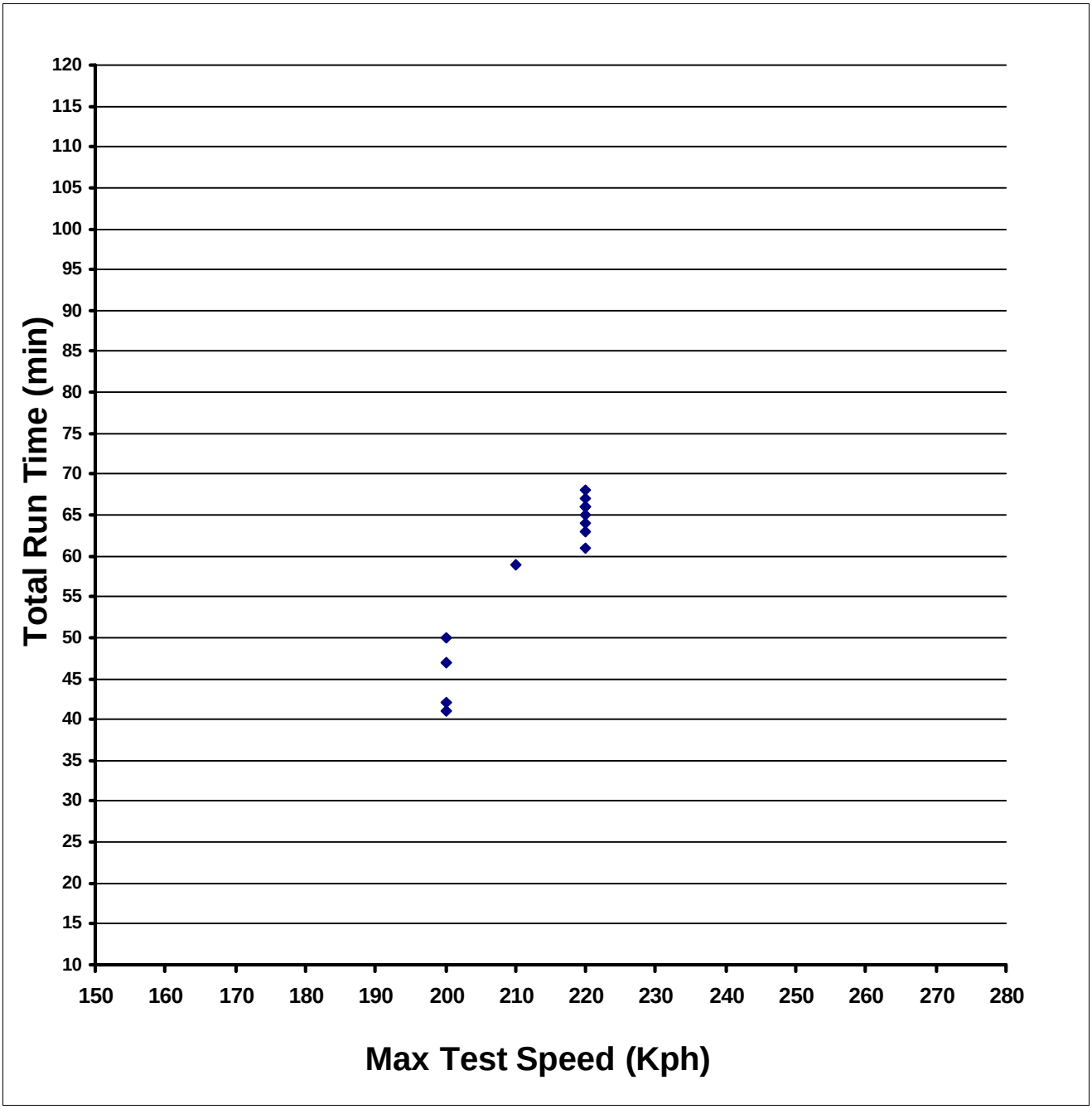

Passenger High Speed - P225/60R16 H - Load Effect
100
90
80
70
60
50
40
30
20
10
0
Minutes to Failure
76
65
80%
90%
Percent of Maximum Load
All Tires

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-80-180-A-RMA

Size: P225/60R16 Speed: H Load (%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-80-180-A-RMA

Size: P225/60R16 Speed: H Load(%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

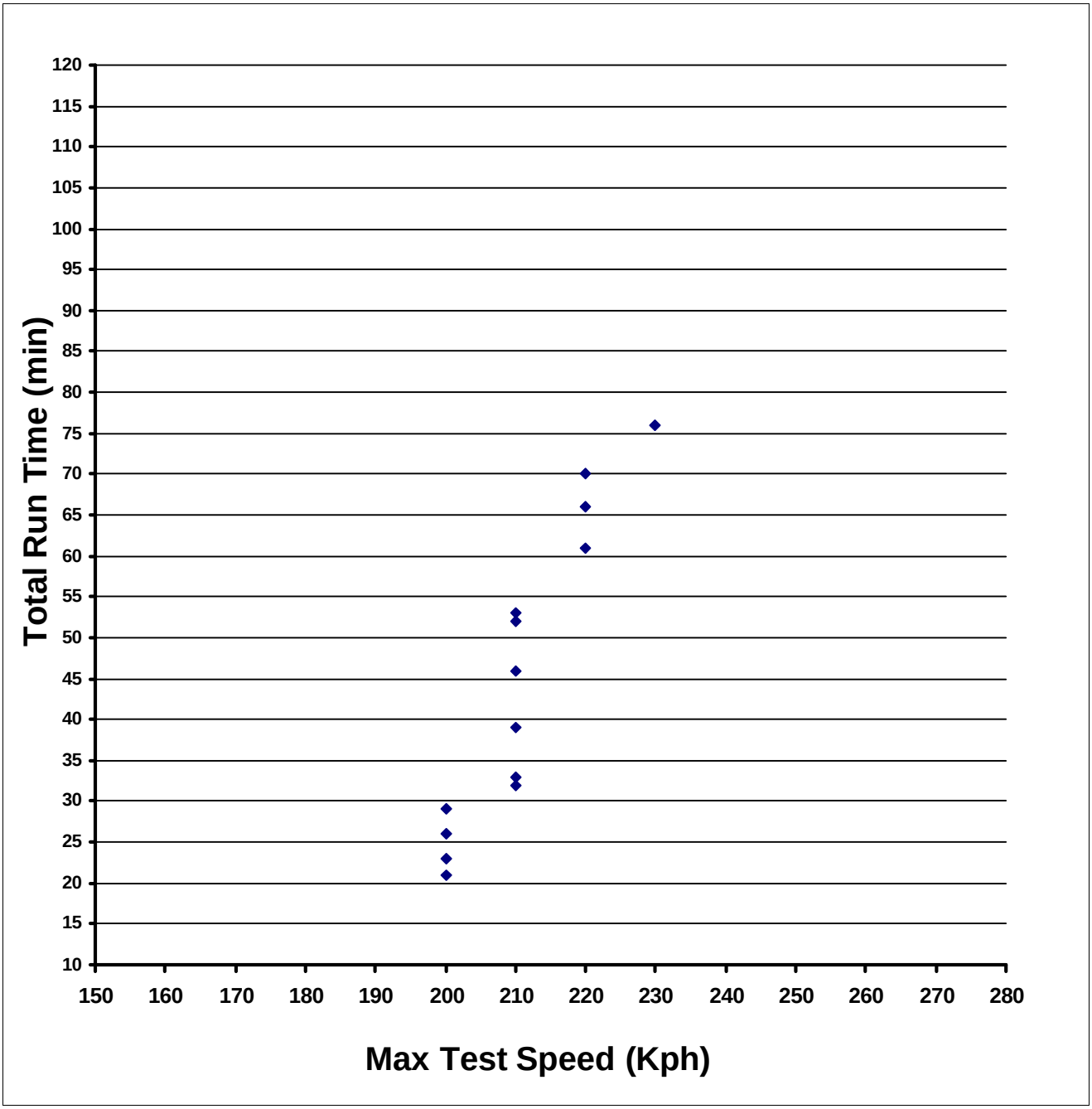
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	8	68
	220	7	67
	220	6	66
	220	6	66
	220	6	66
	220	5	65
	220	4	64
	220	3	63
	220	1	61
	210	9	59
	200	10	50
	200	7	47
	200	2	42
	200	1	41
Maximum:	**220**		**68**
Minimum:	**200**		**41**
Average:			**58.929**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-80-180-B-RMA

Size: P225/60R16 Speed: H Load (%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-80-180-B-RMA

Size: P225/60R16 Speed: H Load(%) 80 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

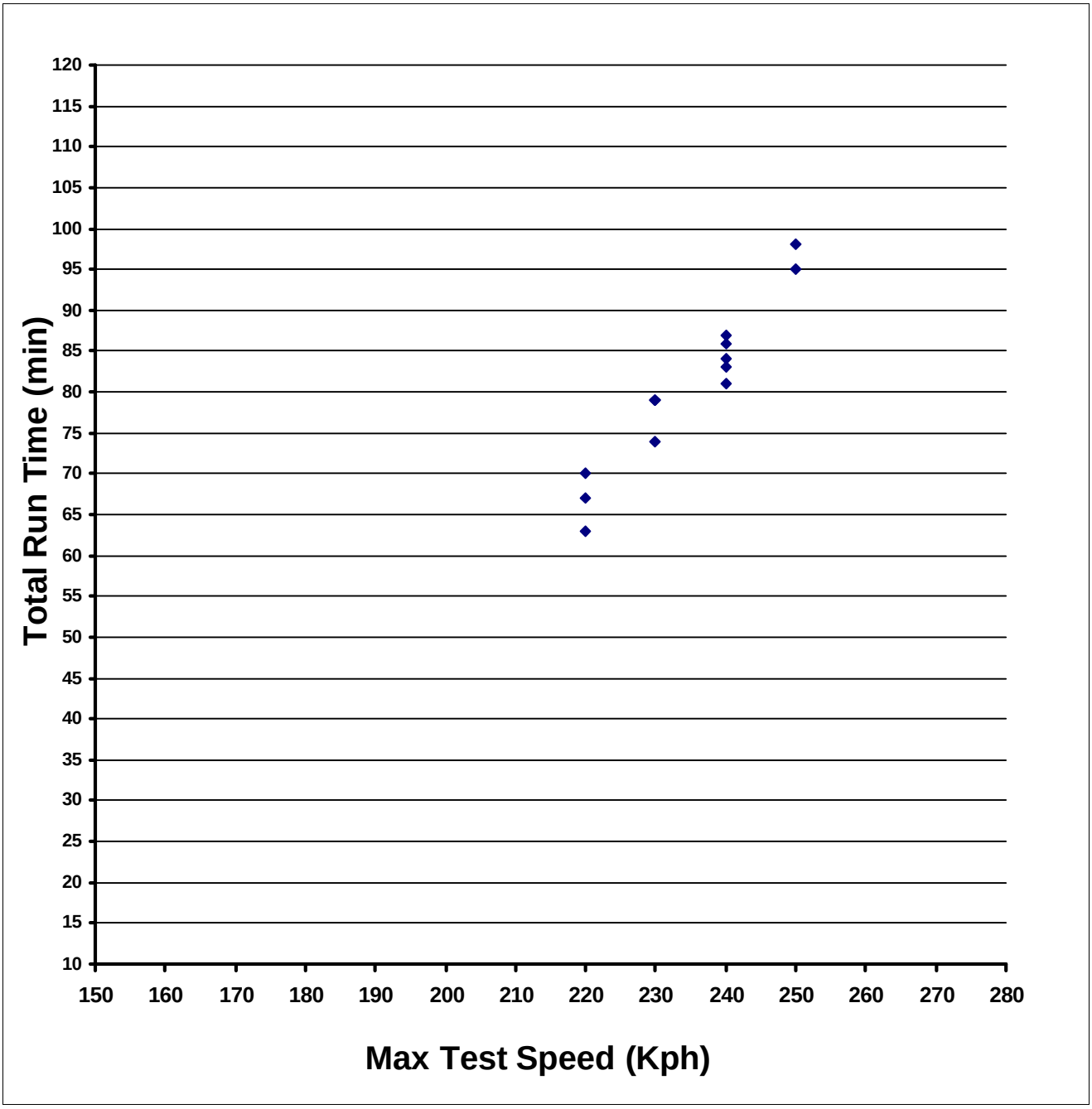
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	230	6	76
	220	10	70
	220	6	66
	220	1	61
	210	23	53
	210	22	52
	210	16	46
	210	9	39
	210	3	33
	210	2	32
	200	9	29
	200	6	26
	200	3	23
	200	1	21
Maximum:	**230**		**76**
Minimum:	**200**		**21**
Average:			**44.786**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-80-240-A-RMA

Size: P225/60R16 Speed: H Load (%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-80-240-A-RMA

Size: P225/60R16 **Speed: H** **Load(%) 80** **Inflation(kPa): 240**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

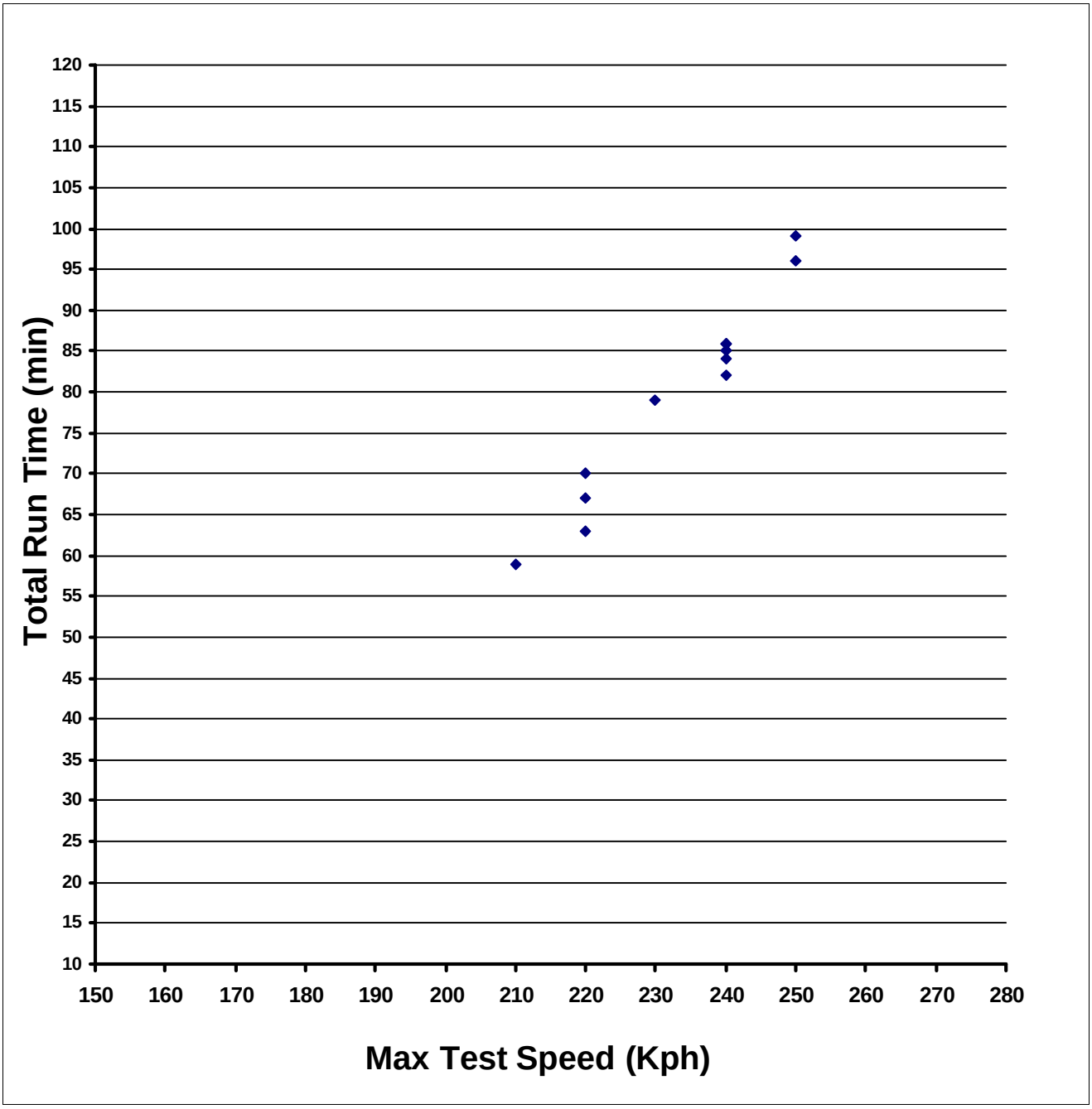
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	250	8	98
	250	5	95
	240	7	87
	240	6	86
	240	4	84
	240	3	83
	240	1	81
	230	9	79
	230	9	79
	230	9	79
	230	4	74
	220	10	70
	220	7	67
	220	3	63
Maximum:	**250**		**98**
Minimum:	**220**		**63**
Average:			**80.357**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-80-240-B-RMA

Size: P225/60R16 Speed: H Load (%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-80-240-B-RMA

Size: P225/60R16 Speed: H Load(%) 80 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

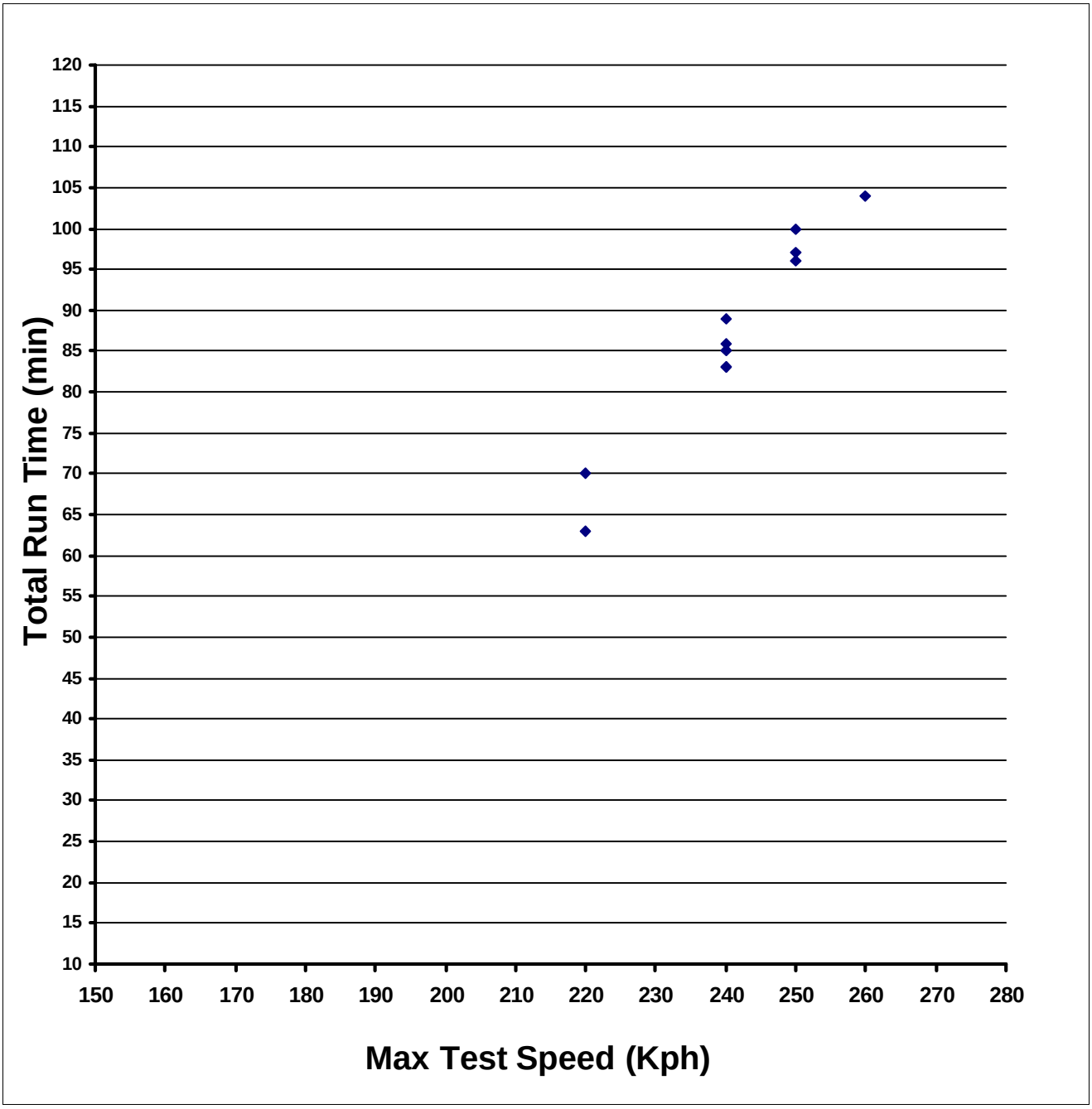
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	250	9	99
	250	6	96
	240	6	86
	240	6	86
	240	6	86
	240	5	85
	240	5	85
	240	4	84
	240	2	82
	230	9	79
	220	10	70
	220	7	67
	220	3	63
	210	29	59
Maximum:	**250**		**99**
Minimum:	**210**		**59**
Average:			**80.5**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-80-280-A-SAE J1561

Size: P225/60R16 Speed: H Load (%) 80 Inflation(kPa): 280

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-80-280-A-SAE J1561

Size: P225/60R16 Speed: H Load(%) 80 Inflation(kPa): 280

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

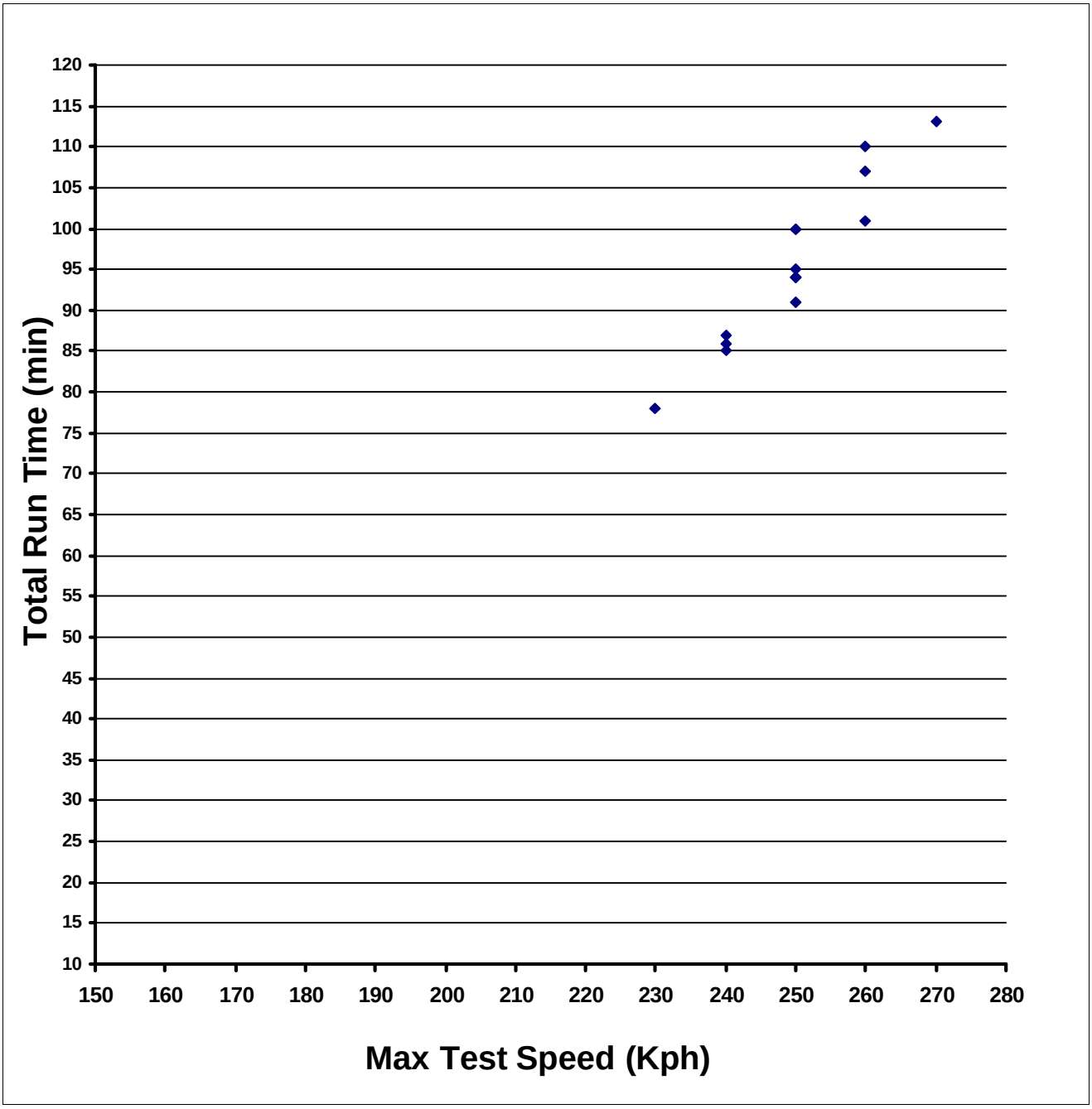
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	260	4	104
	250	10	100
	250	7	97
	250	6	96
	240	9	89
	240	6	86
	240	5	85
	240	5	85
	240	3	83
	240	3	83
	220	10	70
	220	3	63
Maximum:	**260**		**104**
Minimum:	**220**		**63**
Average:			**86.75**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-80-300-A-RMA

Size: P225/60R16 Speed: H Load (%) 80 Inflation(kPa): 300

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-80-300-A-RMA

Size: P225/60R16 **Speed: H** **Load(%) 80** **Inflation(kPa): 300**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

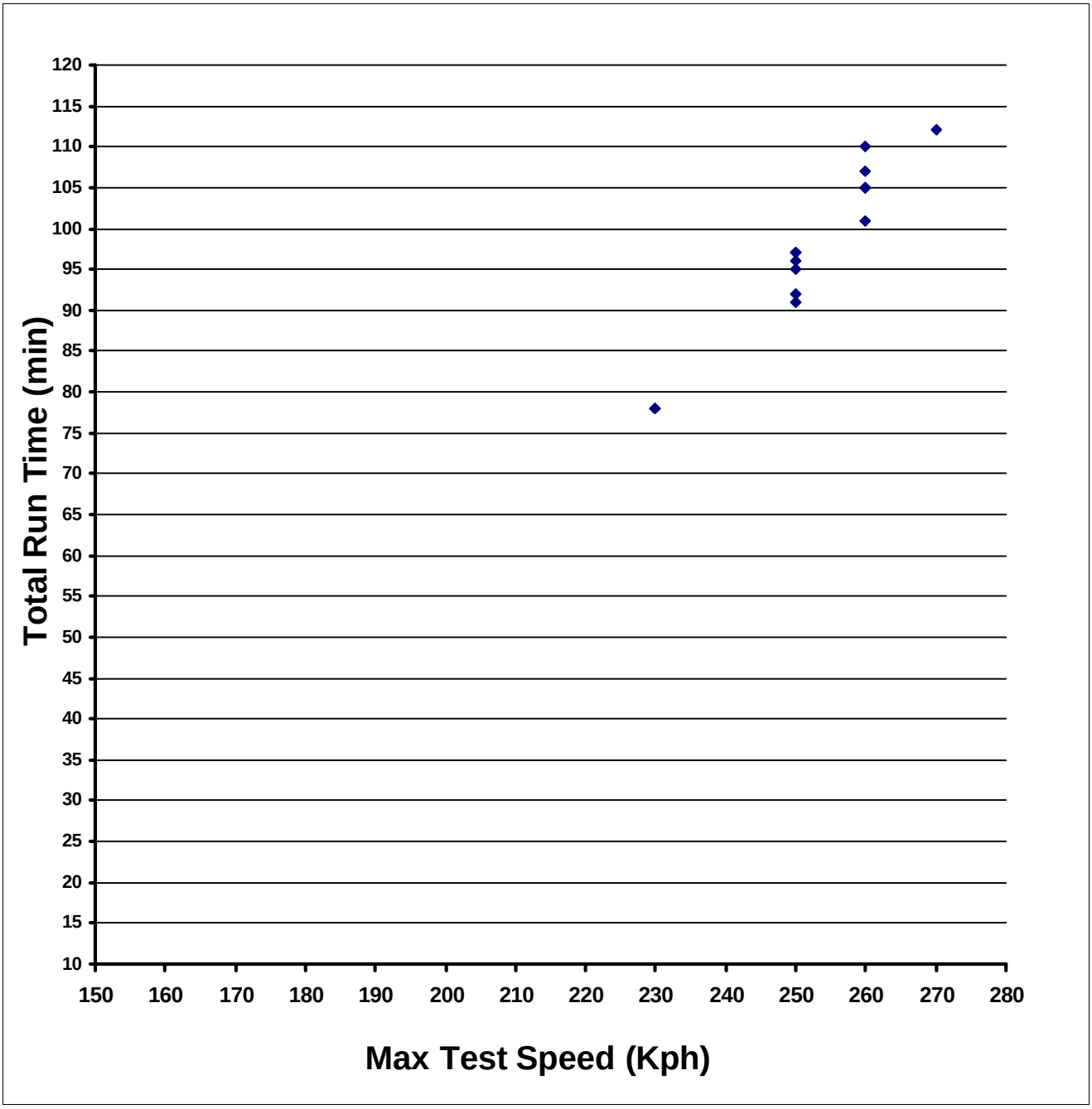
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	270	3	113
	260	10	110
	260	7	107
	260	1	101
	250	10	100
	250	10	100
	250	5	95
	250	4	94
	250	4	94
	250	1	91
	240	7	87
	240	6	86
	240	5	85
	230	8	78
Maximum:	**270**		**113**
Minimum:	**230**		**78**
Average:			**95.786**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-80-300-B-RMA

Size: P225/60R16 Speed: H Load (%) 80 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-80-300-B-RMA

Size: P225/60R16 Speed: H Load(%) 80 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

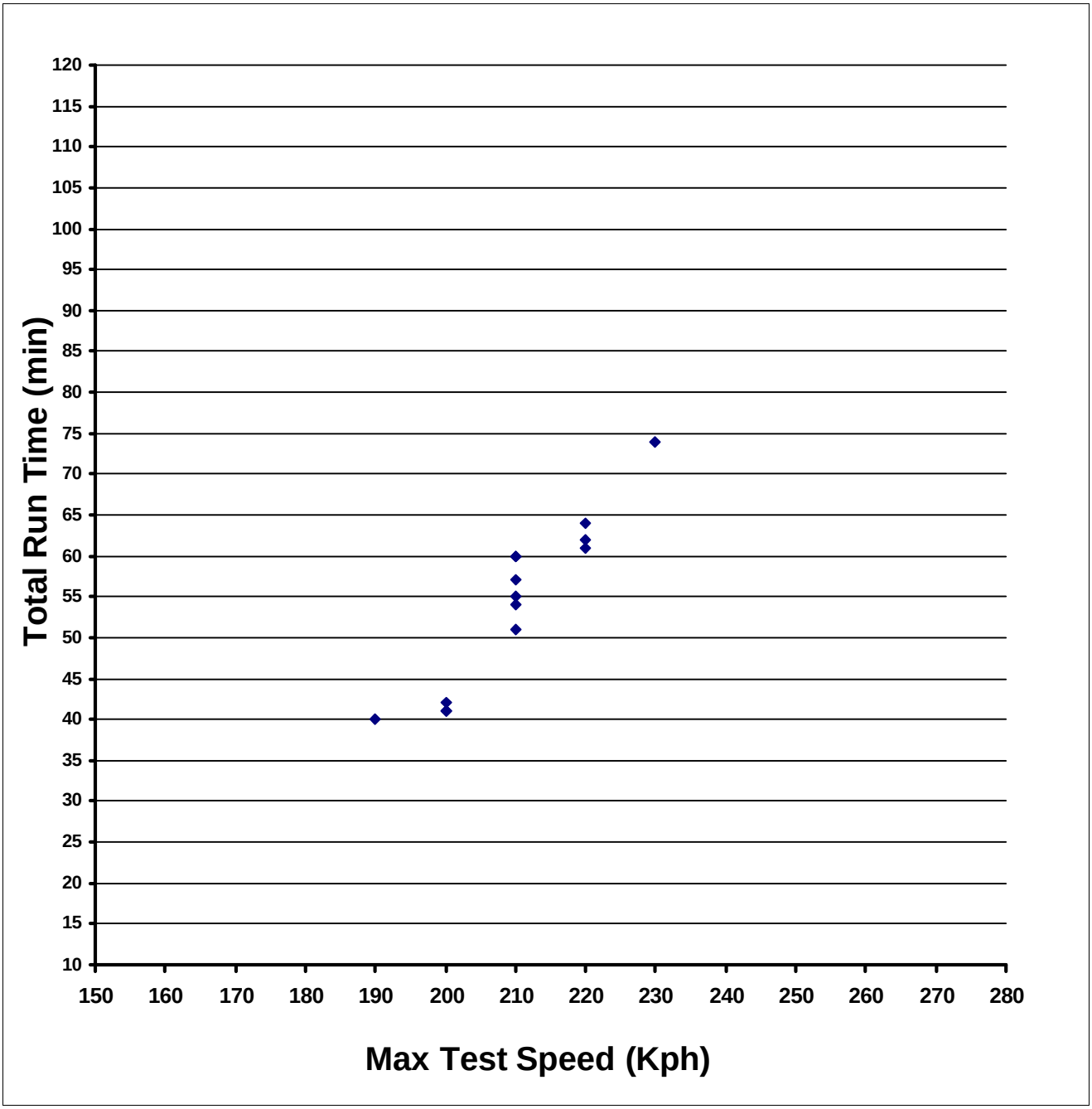
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	270	2	112
	260	10	110
	260	7	107
	260	5	105
	260	5	105
	260	1	101
	250	7	97
	250	7	97
	250	6	96
	250	5	95
	250	2	92
	250	1	91
	230	8	78
	230	8	78
Maximum:	**270**		**112**
Minimum:	**230**		**78**
Average:			**97.429**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-90-180-A-RMA

Size: P225/60R16 Speed: H Load (%) 90 Inflation(kPa): 180

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-90-180-A-RMA

Size: P225/60R16 **Speed: H** **Load(%) 90** **Inflation(kPa): 180**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

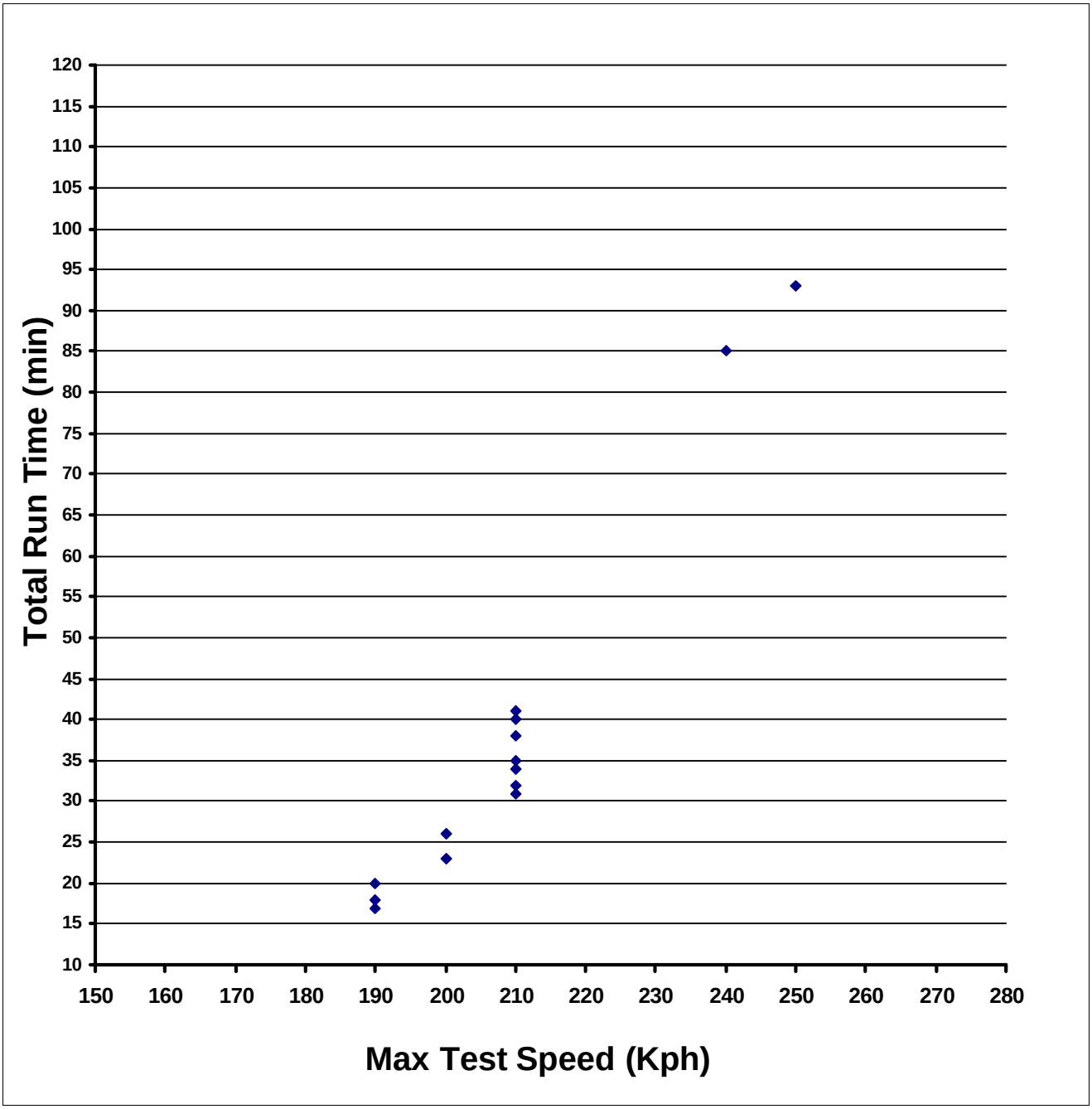
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	230	4	74
	220	4	64
	220	2	62
	220	1	61
	210	10	60
	210	10	60
	210	7	57
	210	5	55
	210	4	54
	210	1	51
	200	2	42
	200	1	41
	200	1	41
	190	10	40
Maximum:	**230**		**74**
Minimum:	**190**		**40**
Average:			**54.429**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-90-180-B-RMA

Size: P225/60R16 Speed: H Load (%) 90 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-90-180-B-RMA

Size: P225/60R16 Speed: H Load(%) 90 Inflation(kPa): 180

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

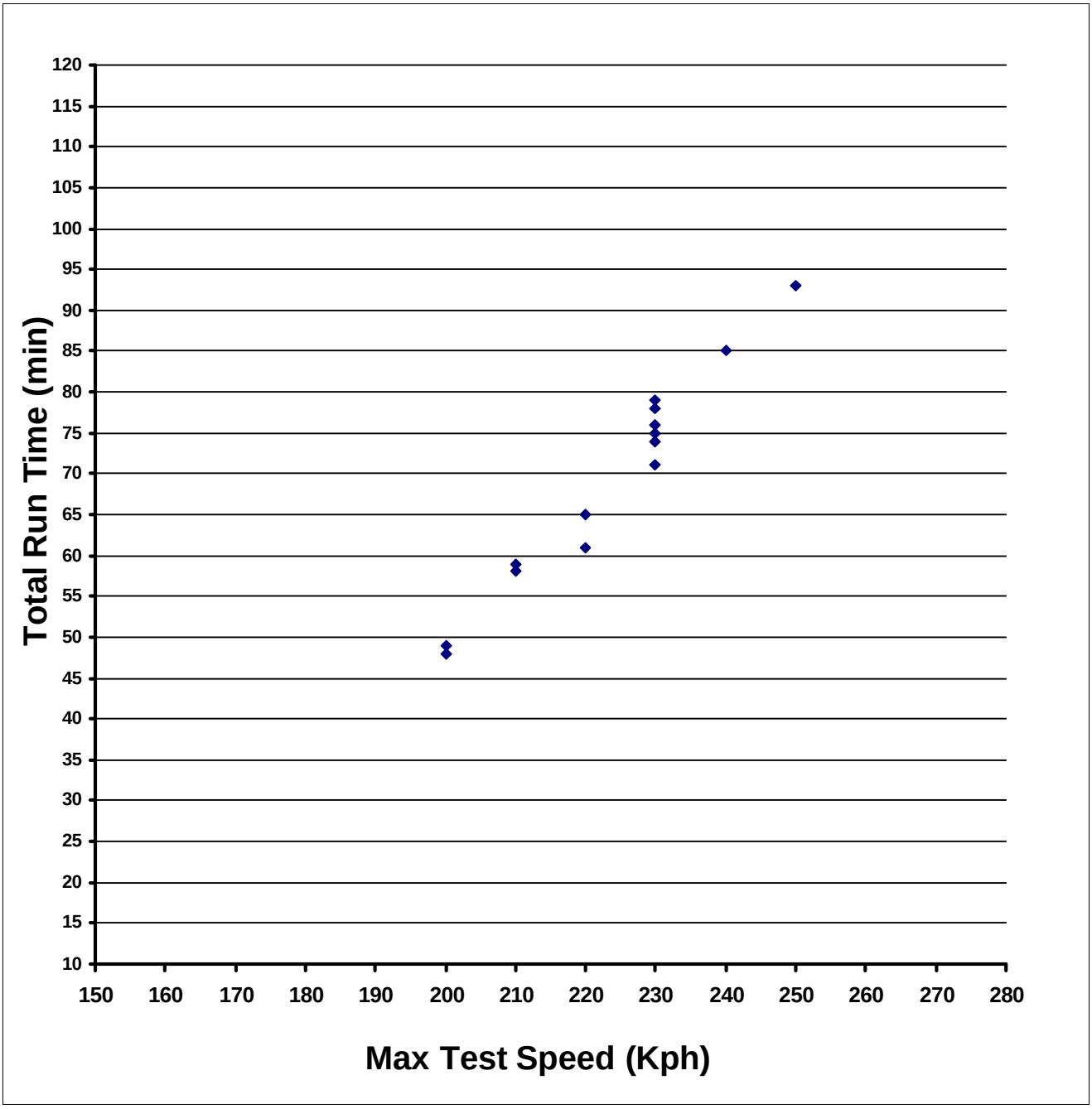
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	250	3	93
	240	5	85
	210	11	41
	210	10	40
	210	8	38
	210	5	35
	210	4	34
	210	2	32
	210	1	31
	200	6	26
	200	3	23
	190	10	20
	190	8	18
	190	7	17
Maximum:	**250**		**93**
Minimum:	**190**		**17**
Average:			**38.071**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-90-240-A-RMA

Size: P225/60R16 Speed: H Load (%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-90-240-A-RMA

Size: P225/60R16 **Speed: H** **Load(%) 90** **Inflation(kPa): 240**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

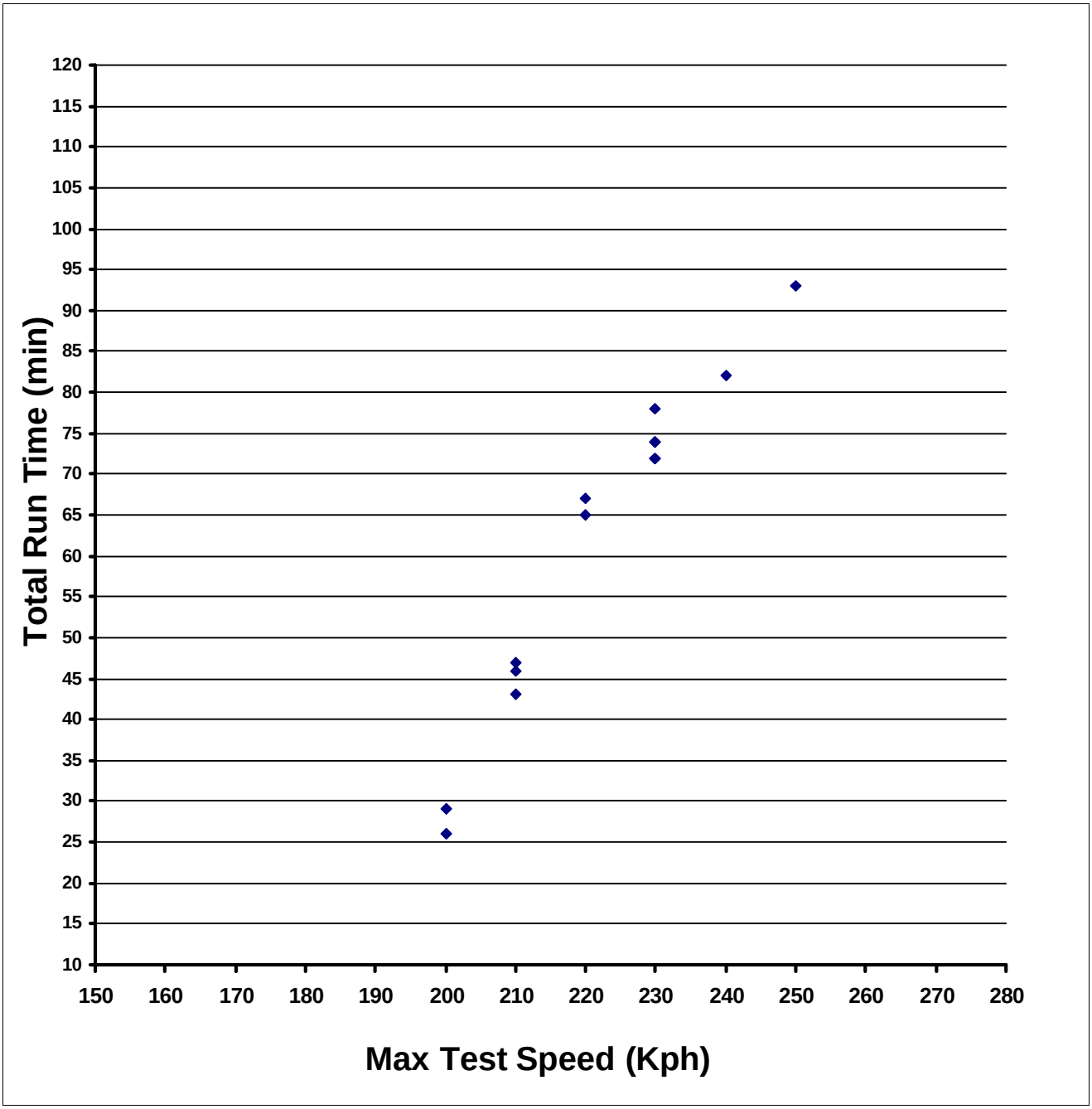
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	250	3	93
	240	5	85
	230	9	79
	230	8	78
	230	6	76
	230	5	75
	230	4	74
	230	1	71
	220	5	65
	220	1	61
	210	9	59
	210	8	58
	200	9	49
	200	8	48
Maximum:	**250**		**93**
Minimum:	**200**		**48**
Average:			**69.357**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-90-240-B-RMA

Size: P225/60R16 Speed: H Load (%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-90-240-B-RMA

Size: P225/60R16 Speed: H Load(%) 90 Inflation(kPa): 240

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

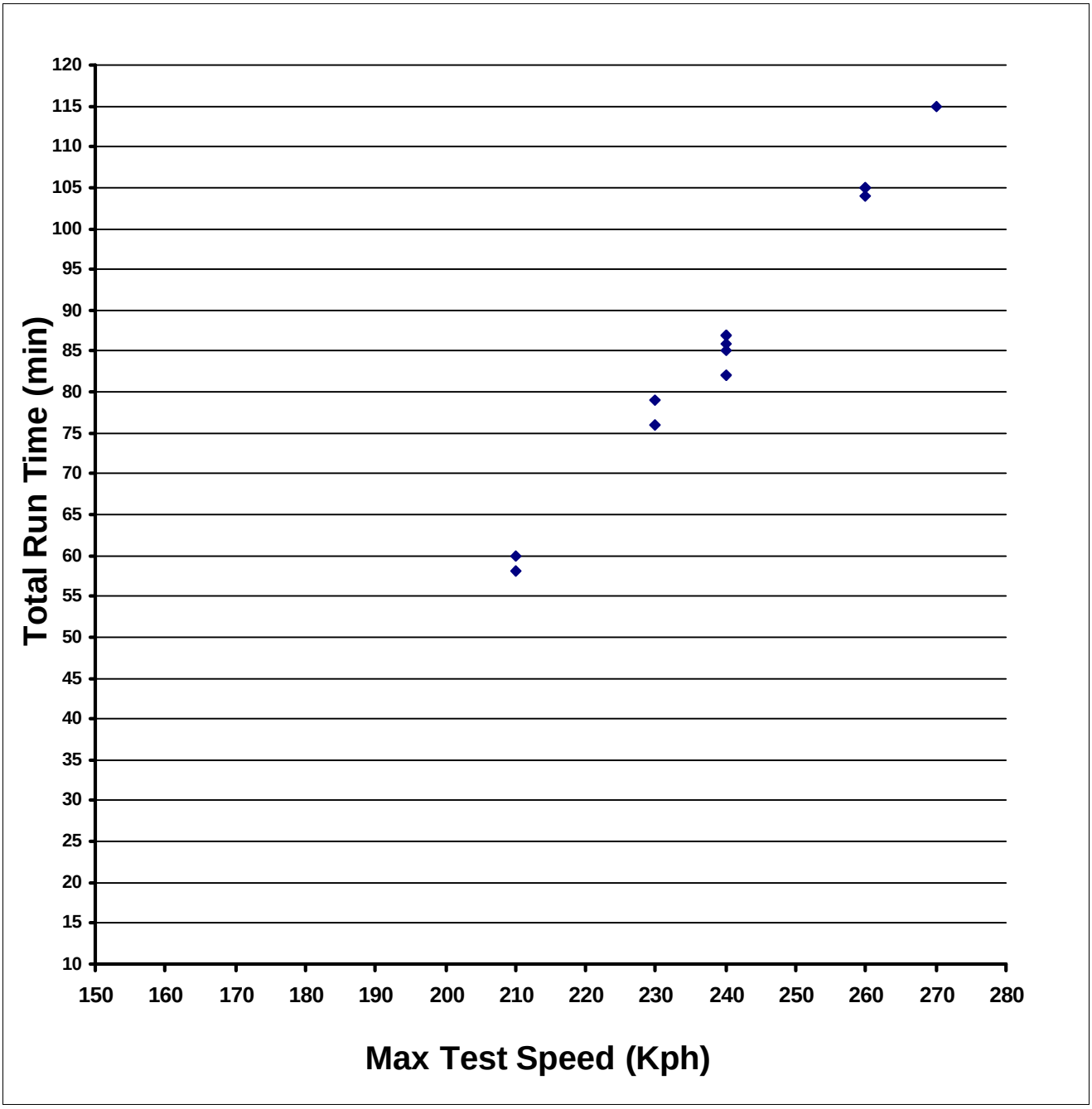
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	250	3	93
	240	2	82
	230	8	78
	230	4	74
	230	4	74
	230	2	72
	230	2	72
	220	7	67
	220	5	65
	210	17	47
	210	16	46
	210	13	43
	200	9	29
	200	6	26
Maximum:	**250**		**93**
Minimum:	**200**		**26**
Average:			**62**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-90-300-A-RMA

Size: P225/60R16 Speed: H Load (%) 90 Inflation(kPa): 300

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**



Passenger High Speed Test Results

Page 2 for Test ID: P225/60R16-H-90-300-A-RMA

Size: P225/60R16 **Speed: H** **Load(%) 90** **Inflation(kPa): 300**

Test Condition: **ITS=RS-40, 0 to ITS, ITS, +10, +20, +30, +40 for 10 min each; then +10kph for 10 min steps to failure**

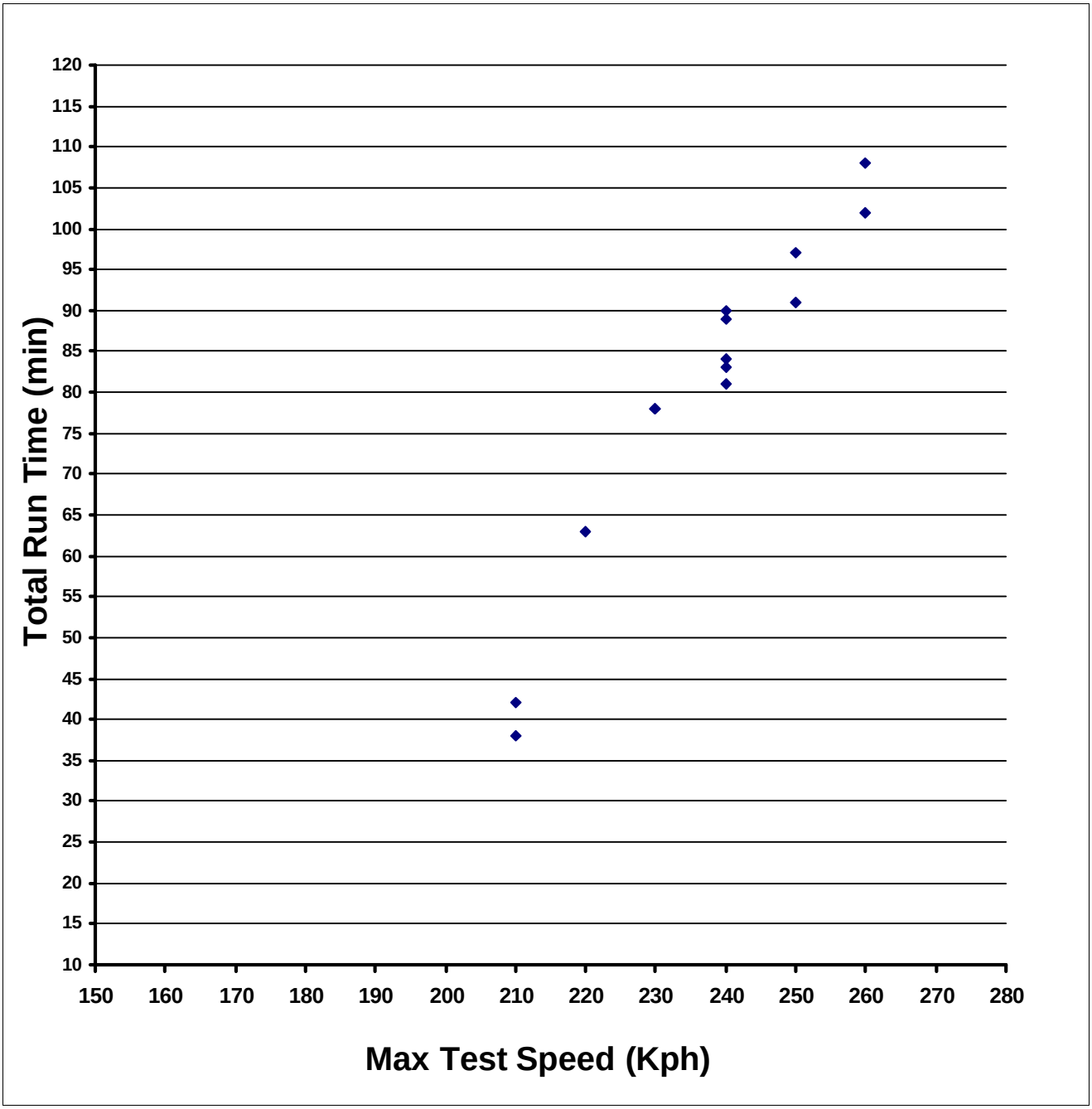
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	270	5	115
	260	5	105
	260	5	105
	260	4	104
	240	7	87
	240	7	87
	240	6	86
	240	5	85
	240	2	82
	240	2	82
	230	9	79
	230	6	76
	210	10	60
	210	8	58
Maximum:	**270**		**115**
Minimum:	**210**		**58**
Average:			**86.5**

Passenger High Speed Test Results

Page 1 for Test ID P225/60R16-H-90-300-B-RMA

Size: P225/60R16 Speed: H Load (%) 90 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



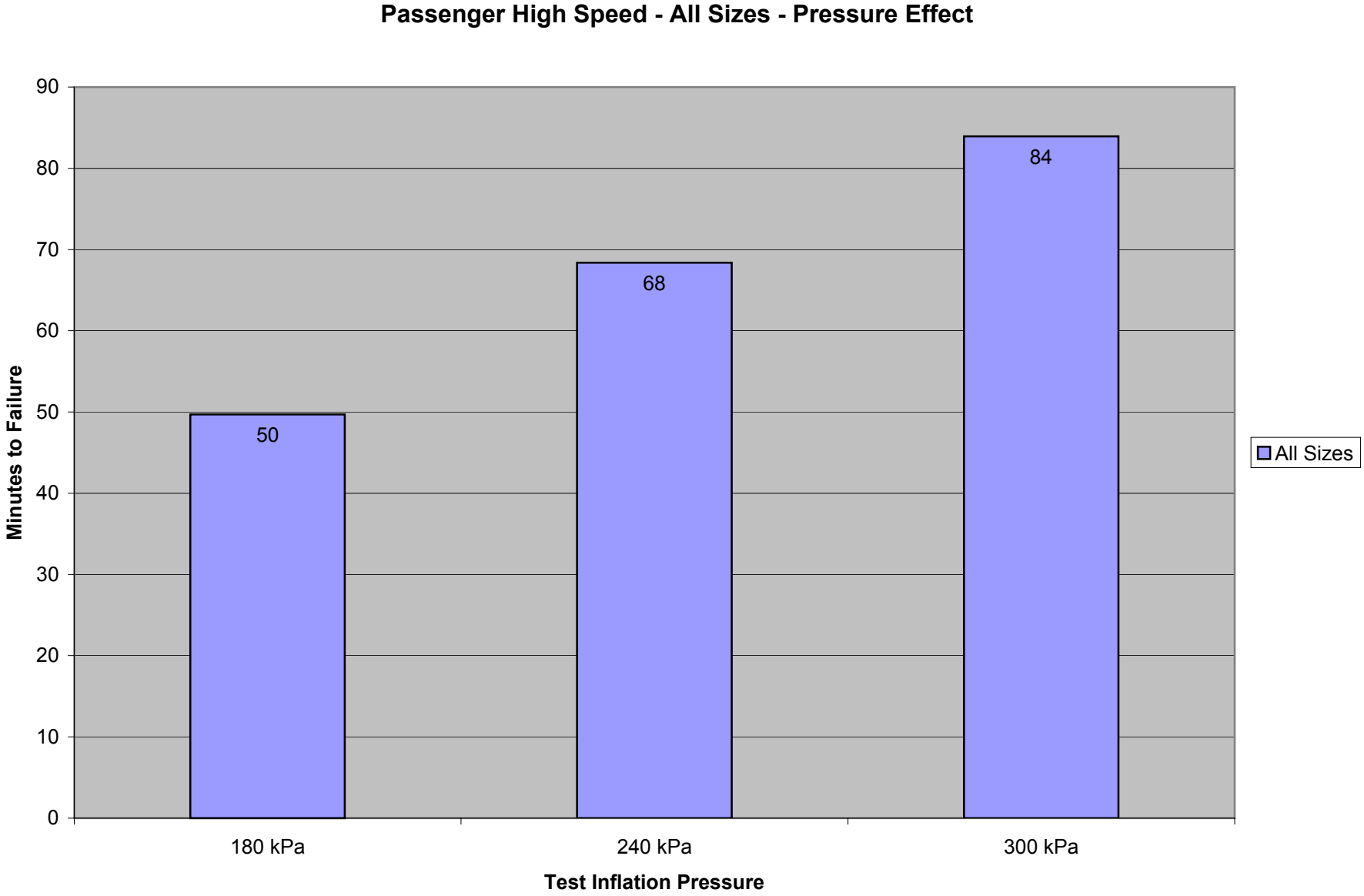
Passenger High Speed Test Results

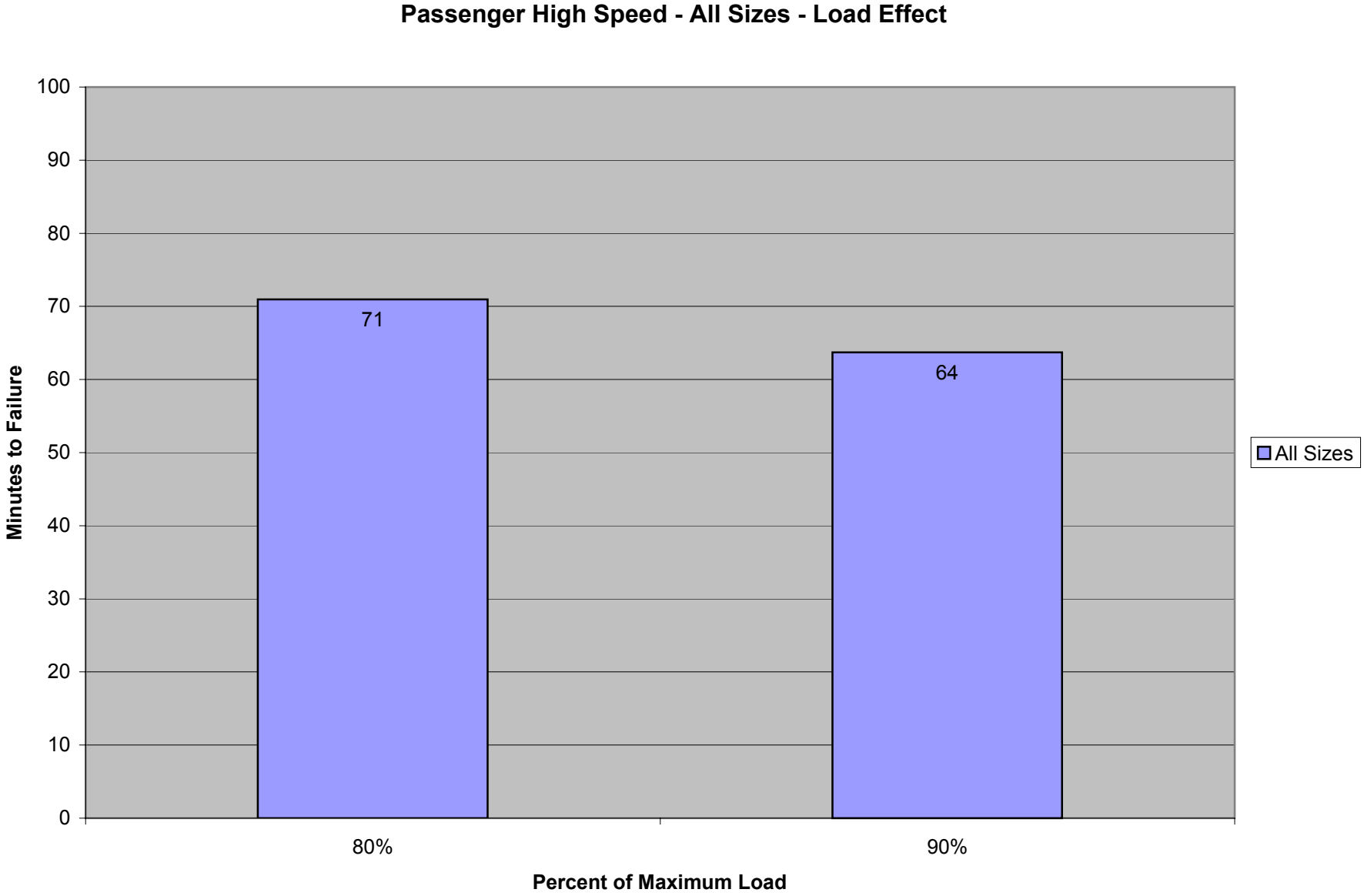
Page 2 for Test ID: P225/60R16-H-90-300-B-RMA

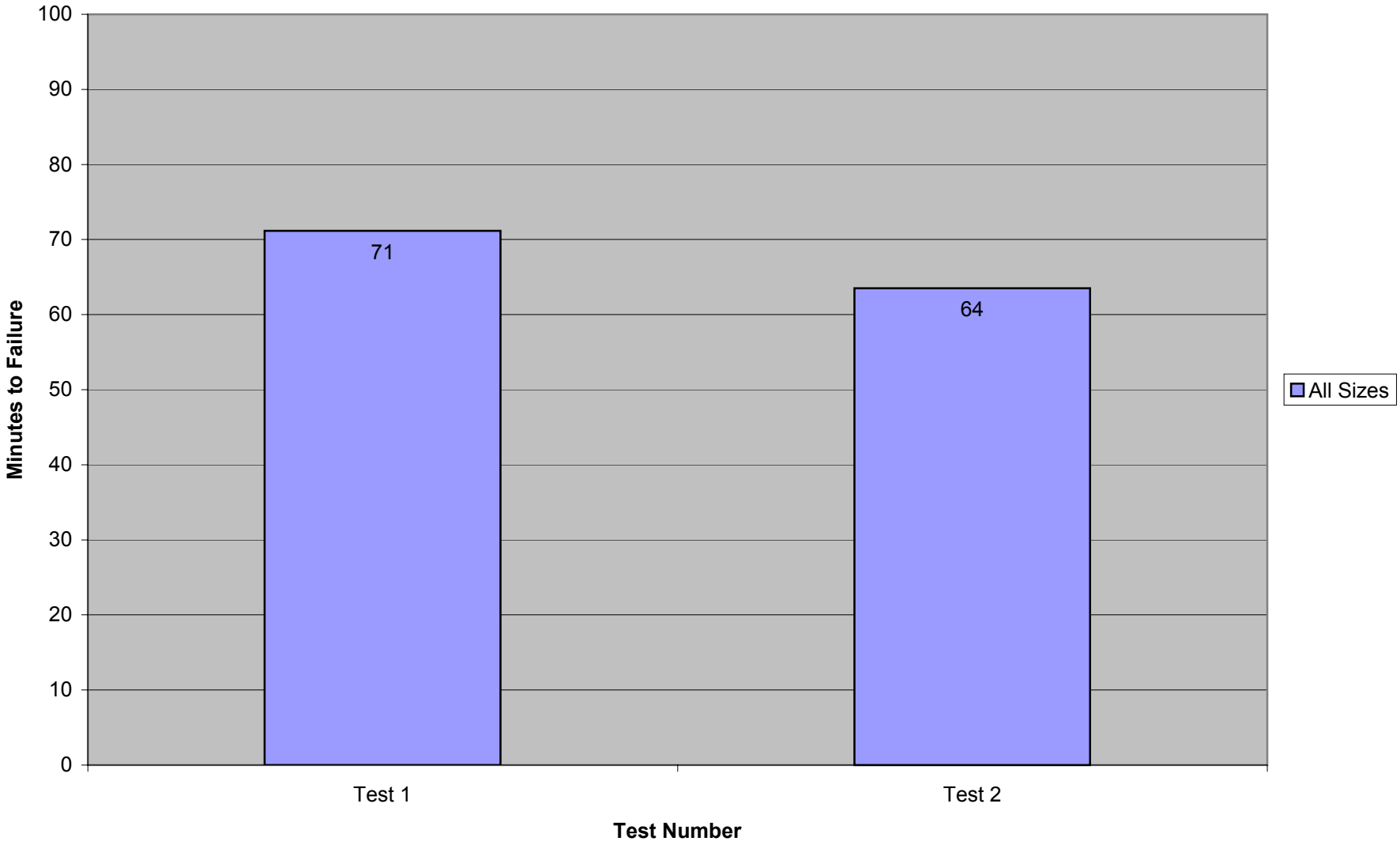
Size: P225/60R16 Speed: H Load(%) 90 Inflation(kPa): 300

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	260	8	108
	260	2	102
	250	7	97
	250	1	91
	240	10	90
	240	9	89
	240	4	84
	240	3	83
	240	1	81
	230	8	78
	230	8	78
	220	3	63
	210	12	42
	210	8	38
Maximum:	**260**		**108**
Minimum:	**210**		**38**
Average:			**80.286**


Passenger High Speed - All Sizes - Pressure Effect
Minutes to Failure
90
80
70
60
50
40
30
20
10
0
50
68
84
180 kPa
240 kPa
300 kPa
Test Inflation Pressure
All Sizes


Passenger High Speed - All Sizes - Load Effect
100
90
80
70
60
50
40
30
20
10
0
Minutes to Failure
71
64
80%
90%
Percent of Maximum Load
All Sizes


All Sizes - Test Effect
100
90
80
70
60
50
40
30
20
10
0
Minutes to Failure
71
64
Test 1
Test 2
Test Number
All Sizes

Passenger Tire High Speed Test
RMA Recommendation

- **SAE J1561** (using 1.7 m diameter test wheel)
  (Same as ISO 10191 with last step at 10 min at Rated Speed)
  - **Inflation Pressure** (Capped)
    - Through N = 240 kPa; P, Q, R, S = 260 kPa; T, U, H = 280 kPa; V, Z = 300 kPa; W, Y = 320 kPa.
  - **Speed**
    - Initial Test Speed (ITS) = Rated Speed (RS) – 40 km/h
    - 0 to ITS, ITS, +10, +20, +30, +40 km/h
  - **Duration**
    - Six 10 minute steps
  - **Load**
    - 80% of the maximum application load
  - **Ambient Temperature**
    - 38° C ± 3° C

Passenger Tire High Speed Test
RMA Recommendation

- More severe than existing DOT 109
- Internationally accepted within ISO
- More severe than ECE - final speed and ambient temperature
- SAE J1561 is recognized by vehicle manufacturers

Passenger Tire High Speed Test
RMA Recommendation

- Acknowledges the need for increases in pressures as the speed increases
- Test the tire at the rated speed
- Acknowledges that the curvature of the test wheel adds stress

Passenger Tire Endurance

RMA Endurance Test Matrix for Study on Passenger Car Tires

The object of this study was to determine the failure point of a popular selected tire size under controlled conditions of ambient temperature, load, inflation pressure, speed, and duration.

Tire size P235/75R15 S was used for this test. As a comparison test, manufacturers were asked to run the current FMVSS 109 endurance test without change. If the test tire did not fail by the end of the 109 34-hour endurance test, the operator continued the test, using 4-hour duration periods with incremental load increases for each period equaling 15% of the maximum load listed on the sidewall until failure occurred. The hours at percent load for failure were recorded on the report form.

To help eliminate anomalies, for each tire size tested, two tires were tested (#1 tire and #2 tire) for each and every test conducted. Each test tire was mounted on the test rim (test rim width tolerance of ± ½ inch) and inflated to the applicable inflation pressure without further adjustment during the test. The mounted test tires were conditioned at the ambient temperature of the test room (38^{o} C) for at least three hours.

Test conditions for speed, inflation pressure, load, duration, ambient temperature and total time are listed in the test matrix on the following pages. Each tire in the study was tested separately at speeds of 120 kph and 140 kph at inflation pressures of 160 kPa and 180 kPa, with ambient temperature of 38^{o}C. The test regimen required each tire to be tested for 24 hours (divided into three 8-hour blocks) under constant conditions of speed, inflation pressure, and ambient temperature. During the 24-hour period each tire was tested for 8 hours at 100 percent of it's maximum load as listed on the sidewall, 8 hours at 110 percent of maximum load, and 8 hours at 115 percent maximum load.

The test operator recorded the failure point of each tire tested in terms of the number of hours run during the 8-hour block at which failure occurred. For instance, in the example matrix shown below, if the number one test tire undergoing the 140 kph speed and 160 kPa inflation pressure test regime failed at 7hours and 45 minutes into the second 8-hour block, the result recorded in the Failure column of the matrix would have read: 7 hrs @ 110. Similarly, if the number two tire running on the same test failed at 2 hours and 30 minutes into the third 8-hour block, the results would have been recorded: 2 hrs @ 115.

If after 24 total hours (three 8-hour periods) of testing there was no tire failure, the operator continued the test, using 4-hour duration periods with incremental load increases for each period equaling 5% of the maximum load listed on the sidewall, until failure occurred. For example, in the sample matrix shown below, for the number one tire tested at 140 kph and 180 kPa if at the end of the third 8-hour block the tire had not failed, the test would have continued for another 4-hour block with the load increased

to 120%. During this last (4-hour) block if the tire failed after 3 hours and 15 minutes, the failure data results would have been recorded as 3 hrs @ 120. Similarly, if the number two tire of the same test completed the first 4-hour block extenuation without failure then another 4-hour block would have been added to the test along with an additional 5% load increase on the tire. If this tire failed at 1 hour and 30 minutes into the second 4-hour period, the results would have been recorded as 1 hr @ 125.

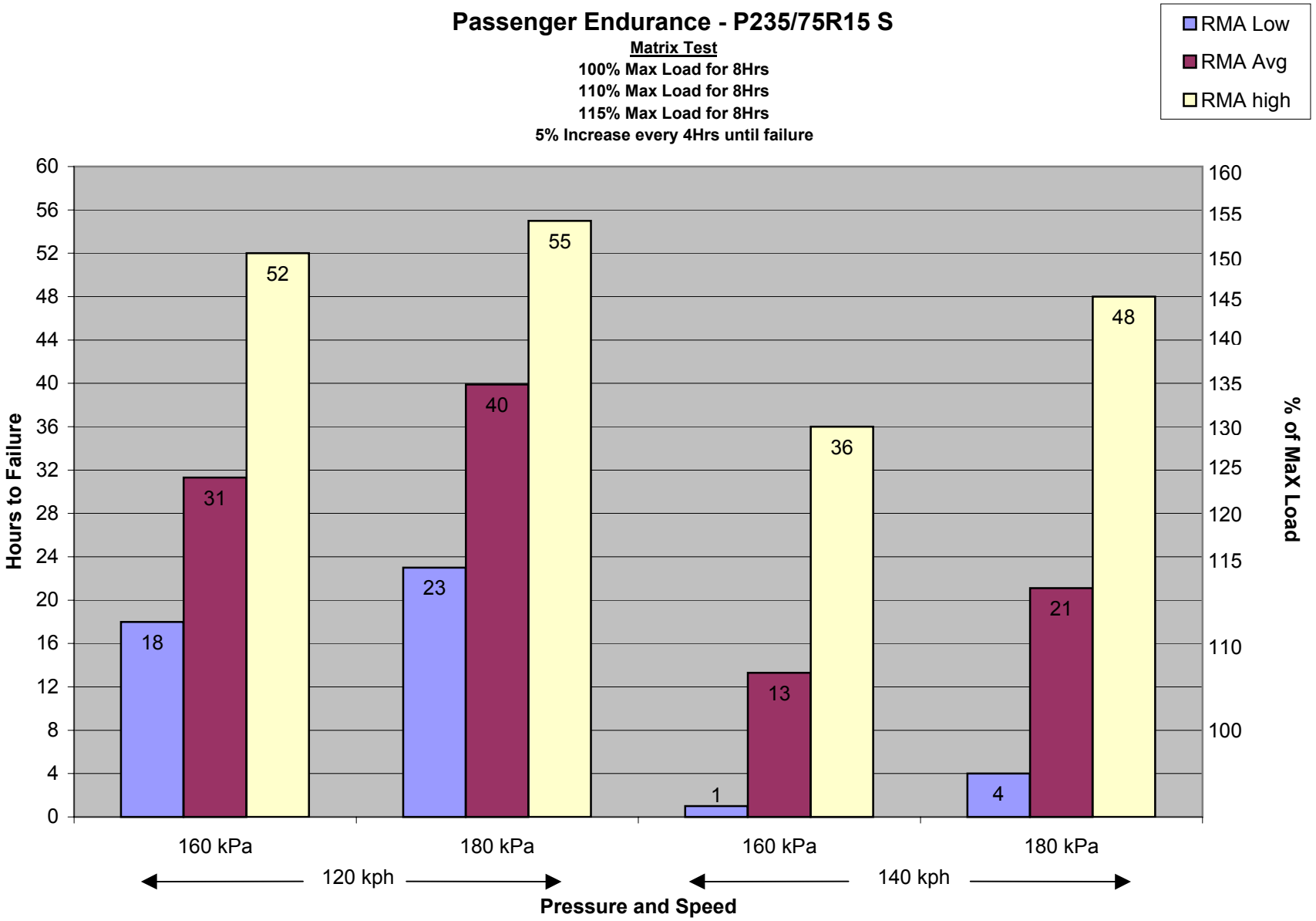
Example of Completed Test Data

TIRE SIZE	**SPEED** (kph)	**INFLATION** (kPa)	**LOAD** (% of maximum listed on sidewall)	**DURATION** (Hours)	**AMBIENT TEMP** (° C)	**TOTAL TIME** (Hours)	**FAILURE** (Hours @ % Load)
P235/75R15 S	140	160	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire *7 @ 110* #2 tire *2 @ 115*
	140	180	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire *3 @ 120* #2 tire *1 @ 125*

On the following page is the test matrix.

TIRE SIZE	SPEED (kph)	INFLATION (kPa)	LOAD (% of maximum listed on sidewall)	DURATION (Hours)	AMBIENT TEMP (°C)	TOTAL TIME (Hours)	FAILURE (Hours @ % Load)
P235/75R15 S	120	160	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
	120	180	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
	140	160	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
	140	180	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire

FMVSS 109 Endurance Test		FAILURE (Hours @ % Load)
P235/75R15S	Run as currently written without change (i.e., Inflation Pressure = 180 kPa; Temperature = 38°C; Three-step Test Condition: first step = 85% max load at 80 kph for 4 hours, second step = 90% max load at 80 kph for 6 hours, and third step = 100% max load at 80 kph for 24 hours). If failure doesn't occur before end of specified test duration, continue testing under same conditions of speed, inflation pressure, and ambient temperature, but add 15% load increase increments for 4 hours each till failure.	#1 tire #2 tire

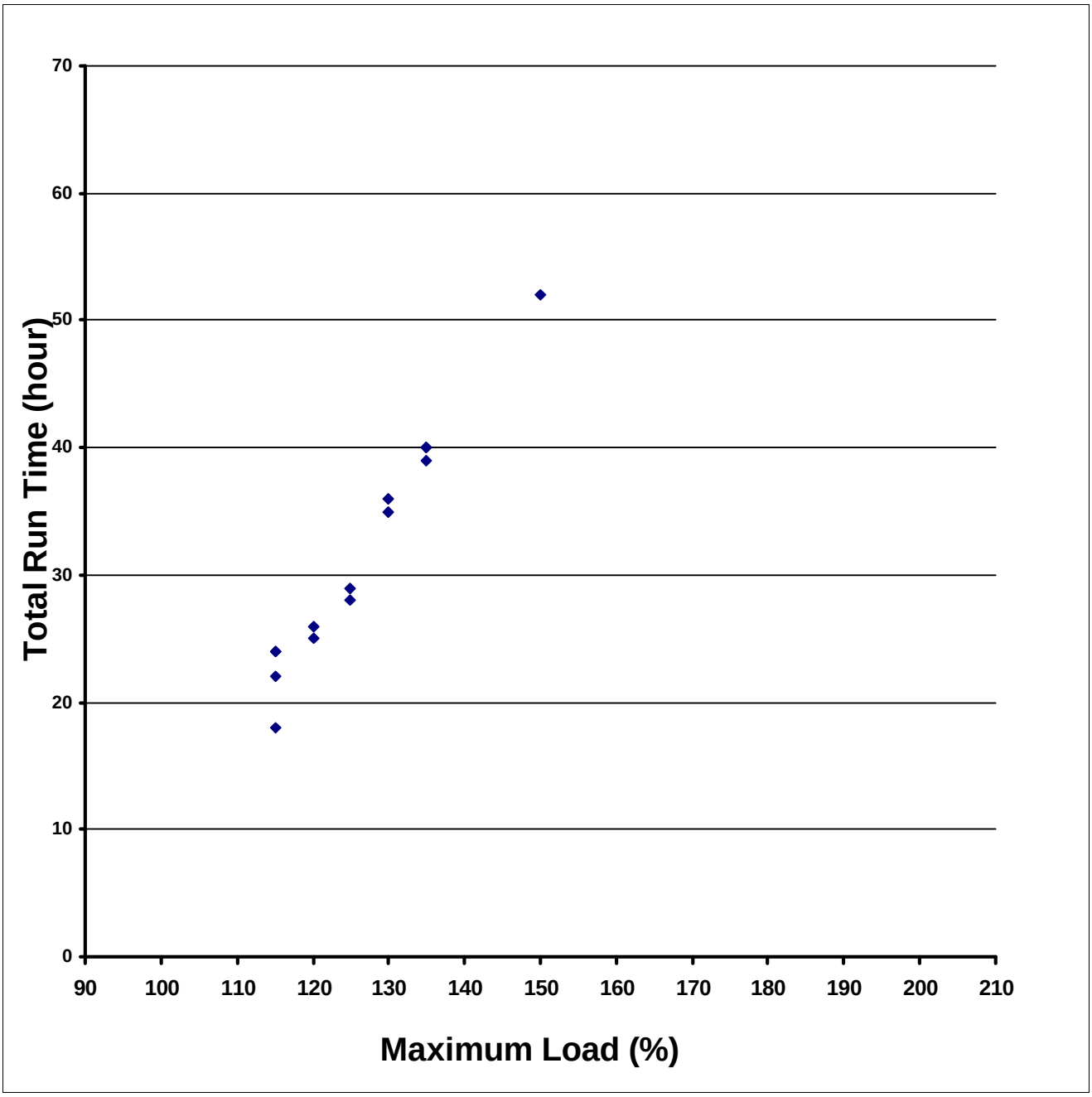

Passenger Endurance - P235/75R15 S
Matrix Test
100% Max Load for 8Hrs
110% Max Load for 8Hrs
115% Max Load for 8Hrs
5% Increase every 4Hrs until failure
RMA Low
RMA Avg
RMA high
Hours to Failure
% of MaX Load
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
160
155
150
145
140
135
130
125
120
115
110
100
18
31
52
23
40
55
1
13
36
4
21
48
160 kPa
180 kPa
160 kPa
180 kPa
120 kph
140 kph
Pressure and Speed

Passenger Endurance Test Results

Page 1 for Test ID P235/75R15-S-120-160-RMA

Size: P235/75R15 **Test Speed(kph): 120** **Inflation(kPa): 160**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Passenger Endurance Test Results

Page 2 for Test ID: P235/75R15-S-120-160-RMA

Size: P235/75R15 **Test Speed (kph): 120** **Inflation(kPa): 160**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

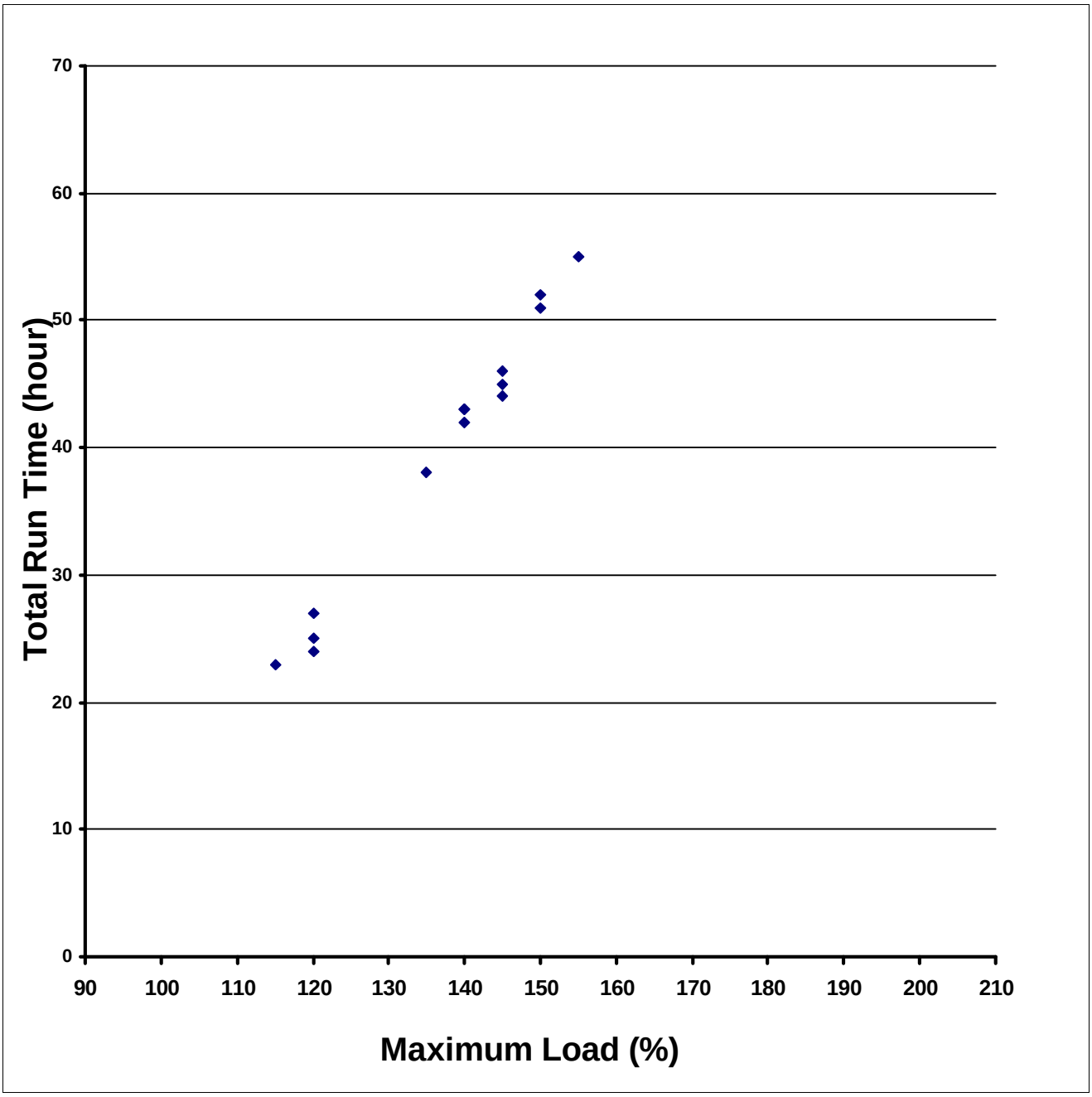
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	150	4	52
	135	4	40
	135	4	40
	135	3	39
	130	4	36
	130	3	35
	125	1	29
	125	0	28
	120	2	26
	120	1	25
	115	8	24
	115	8	24
	115	6	22
	115	2	18
Maximum:	**150**		**52**
Minimum:	**115**		**18**
Average:			**31.286**

Passenger Endurance Test Results

Page 1 for Test ID P235/75R15-S-120-180-RMA

Size: P235/75R15 **Test Speed(kph): 120** **Inflation(kPa): 180**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Passenger Endurance Test Results

Page 2 for Test ID: P235/75R15-S-120-180-RMA

Size: P235/75R15 **Test Speed (kph): 120** **Inflation(kPa): 180**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

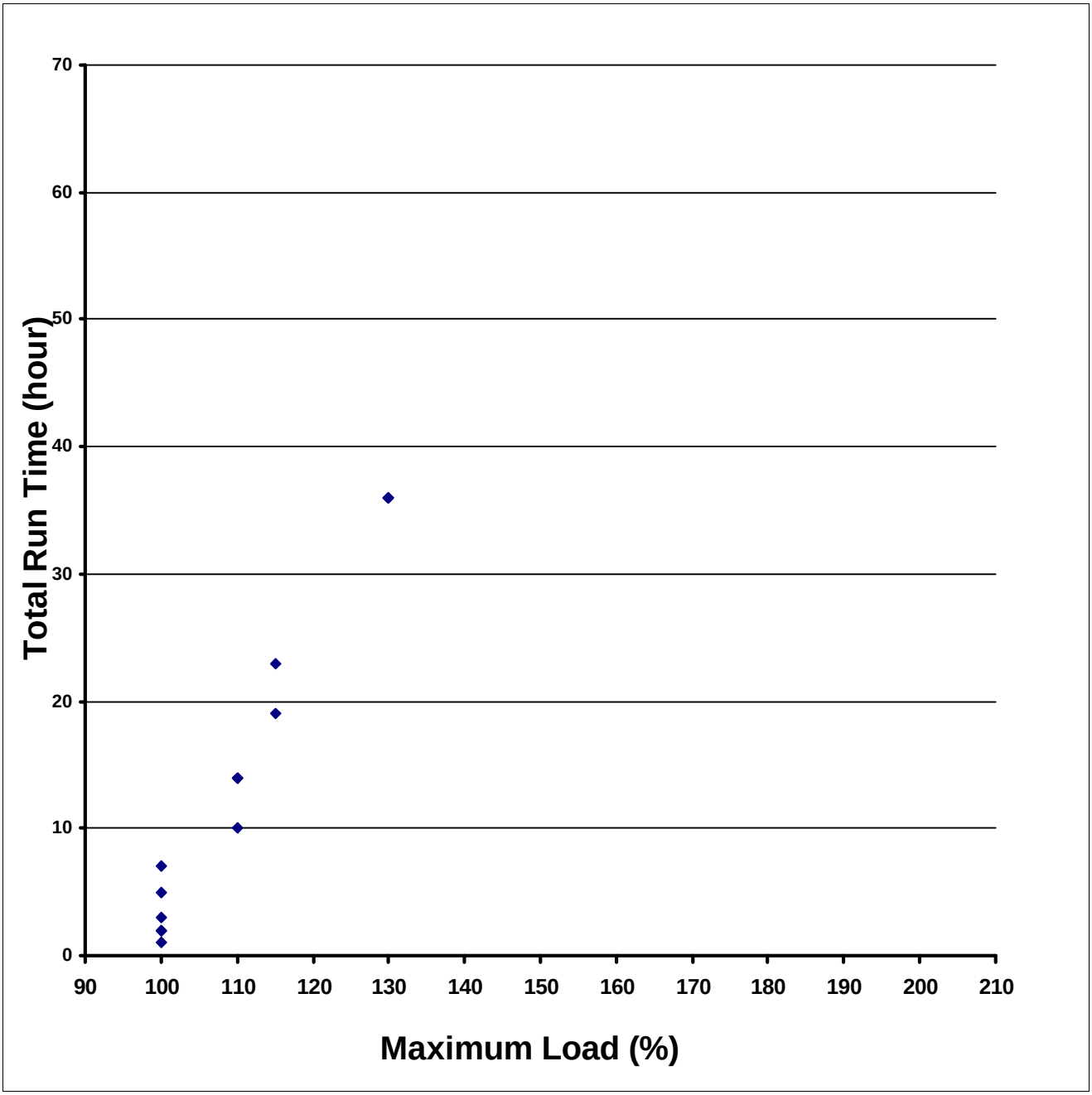
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	155	3	55
	150	4	52
	150	3	51
	145	2	46
	145	1	45
	145	0	44
	140	3	43
	140	3	43
	140	2	42
	135	2	38
	120	3	27
	120	1	25
	120	0	24
	115	7	23
Maximum:	**155**		**55**
Minimum:	**115**		**23**
Average:			**39.857**

Passenger Endurance Test Results

Page 1 for Test ID P235/75R15-S-140-160-RMA

Size: P235/75R15 **Test Speed(kph): 140** **Inflation(kPa): 160**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Passenger Endurance Test Results

Page 2 for Test ID: P235/75R15-S-140-160-RMA

Size: P235/75R15 **Test Speed (kph): 140** **Inflation(kPa): 160**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

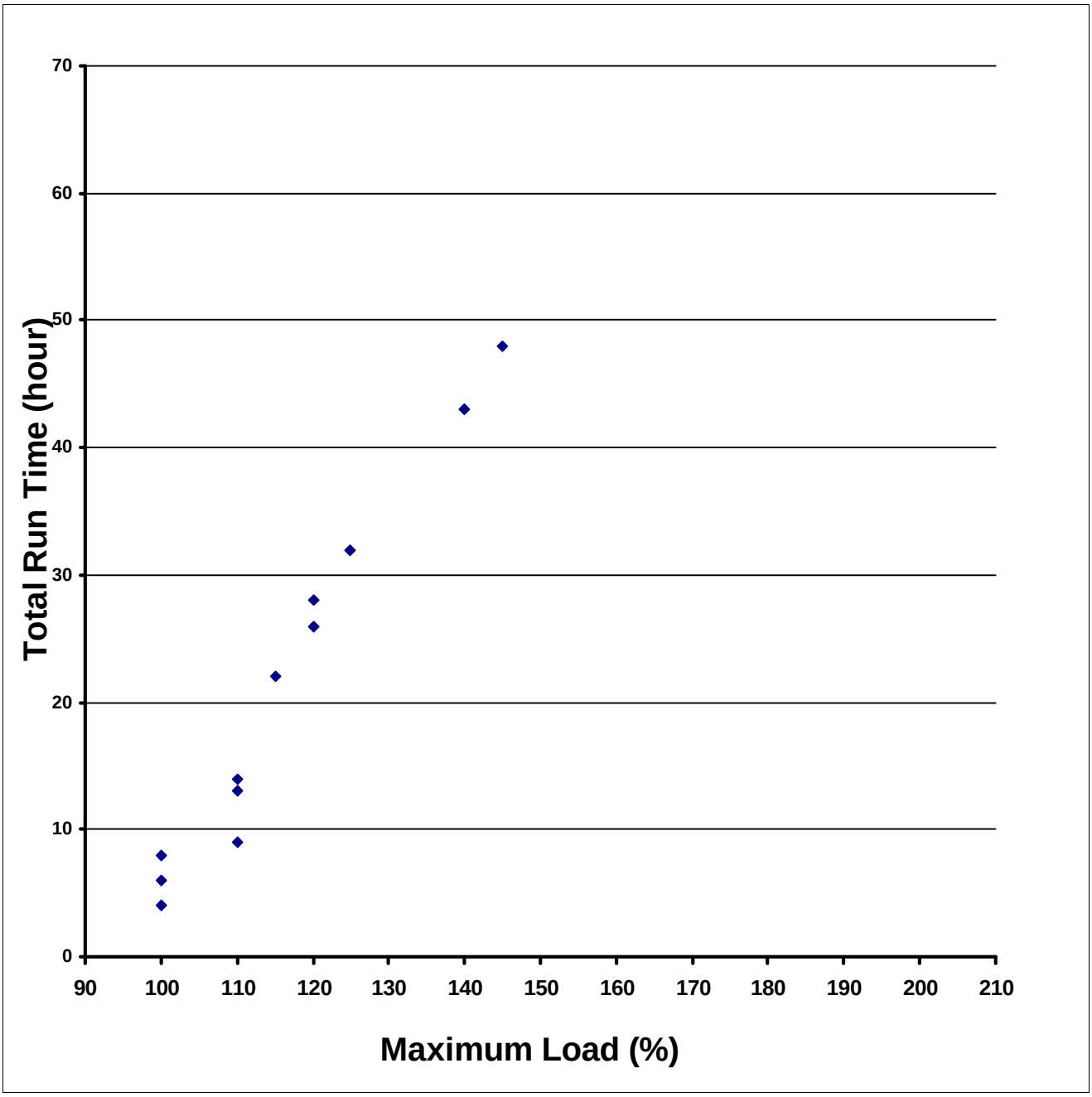
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	130	4	36
	130	4	36
	115	7	23
	115	3	19
	110	6	14
	110	6	14
	110	6	14
	110	2	10
	100	7	7
	100	5	5
	100	3	3
	100	2	2
	100	2	2
	100	1	1
Maximum:	**130**		**36**
Minimum:	**100**		**1**
Average:			**13.286**

Passenger Endurance Test Results

Page 1 for Test ID P235/75R15-S-140-180-RMA

Size: P235/75R15 **Test Speed(kph): 140** **Inflation(kPa): 180**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Passenger Endurance Test Results

Page 2 for Test ID: P235/75R15-S-140-180-RMA

Size: P235/75R15 **Test Speed (kph): 140** **Inflation(kPa): 180**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

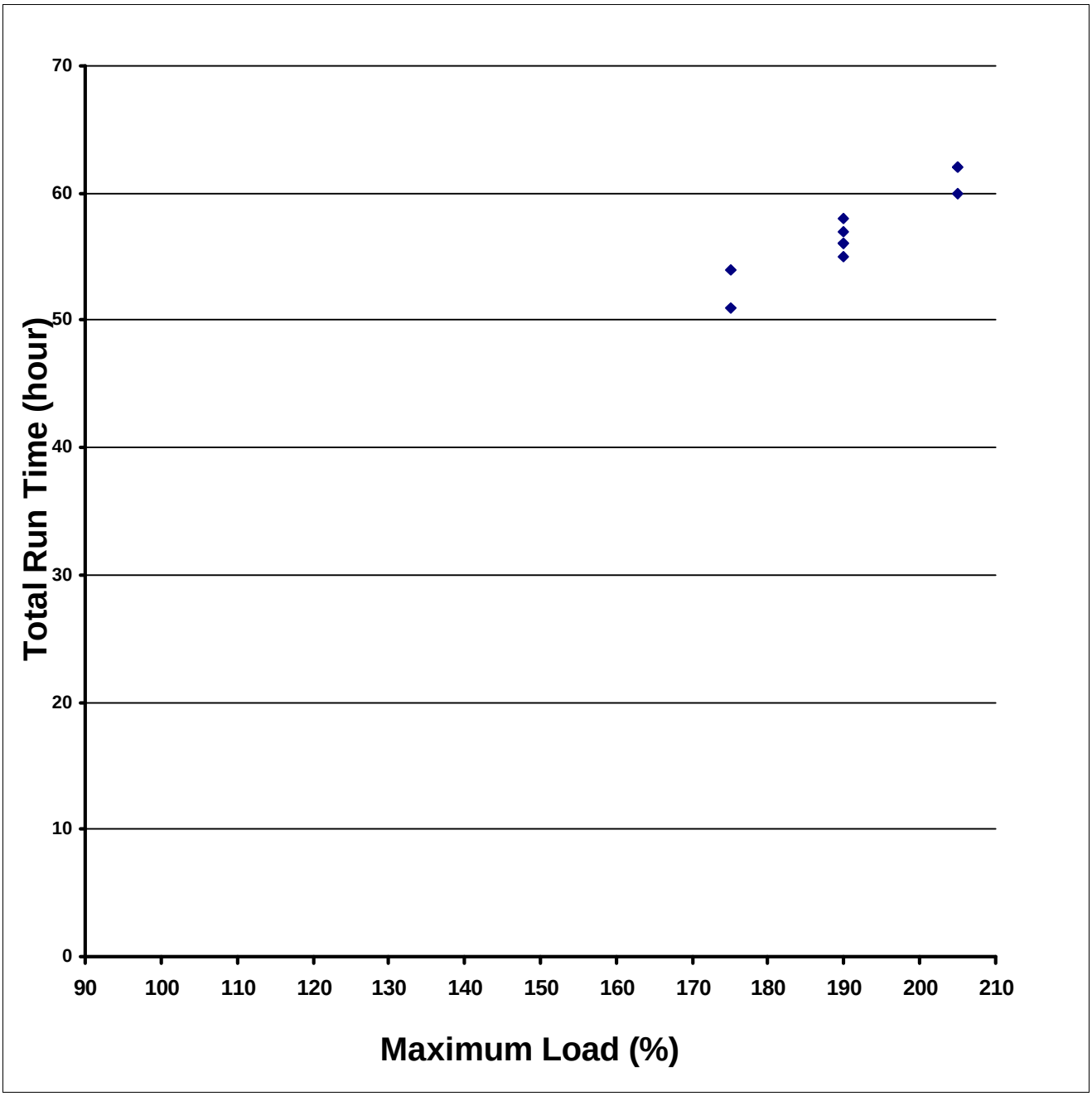
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	145	4	48
	140	3	43
	125	4	32
	120	4	28
	120	2	26
	115	6	22
	110	6	14
	110	5	13
	110	1	9
	100	8	8
	100	6	6
	100	4	4
Maximum:	**145**		**48**
Minimum:	**100**		**4**
Average:			**21.083**

Passenger Endurance Test Results

Page 1 for Test ID P235/75R15-S-80-180-FMVSS109

Size: P235/75R15 **Test Speed(kph): 80** **Inflation(kPa): 180**

Test Condition: **Load=85% for 4hrs, 90% for 6hrs, 100% for 24hrs, then +15% for 4 hour steps to failure**



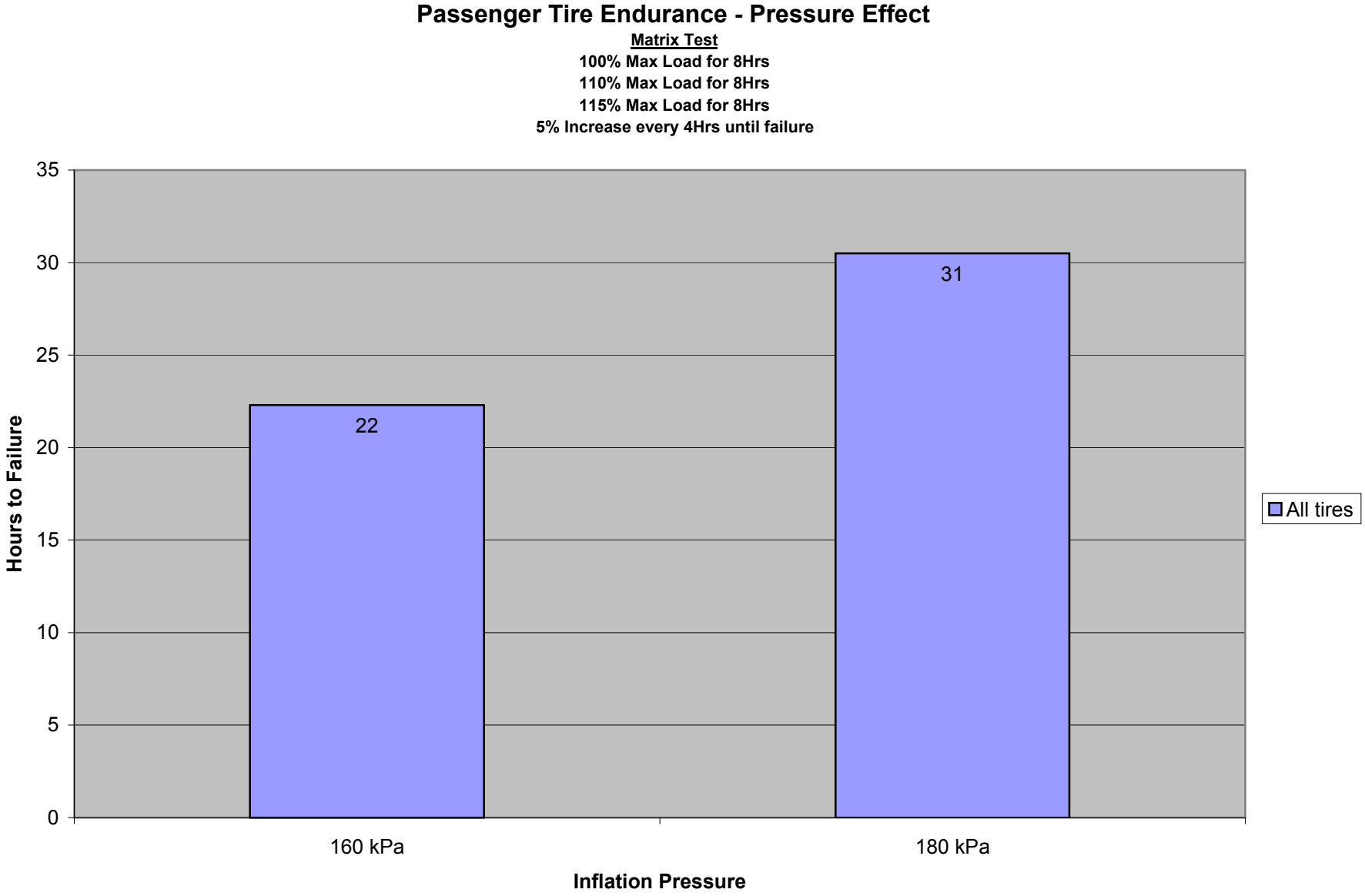
Passenger Endurance Test Results

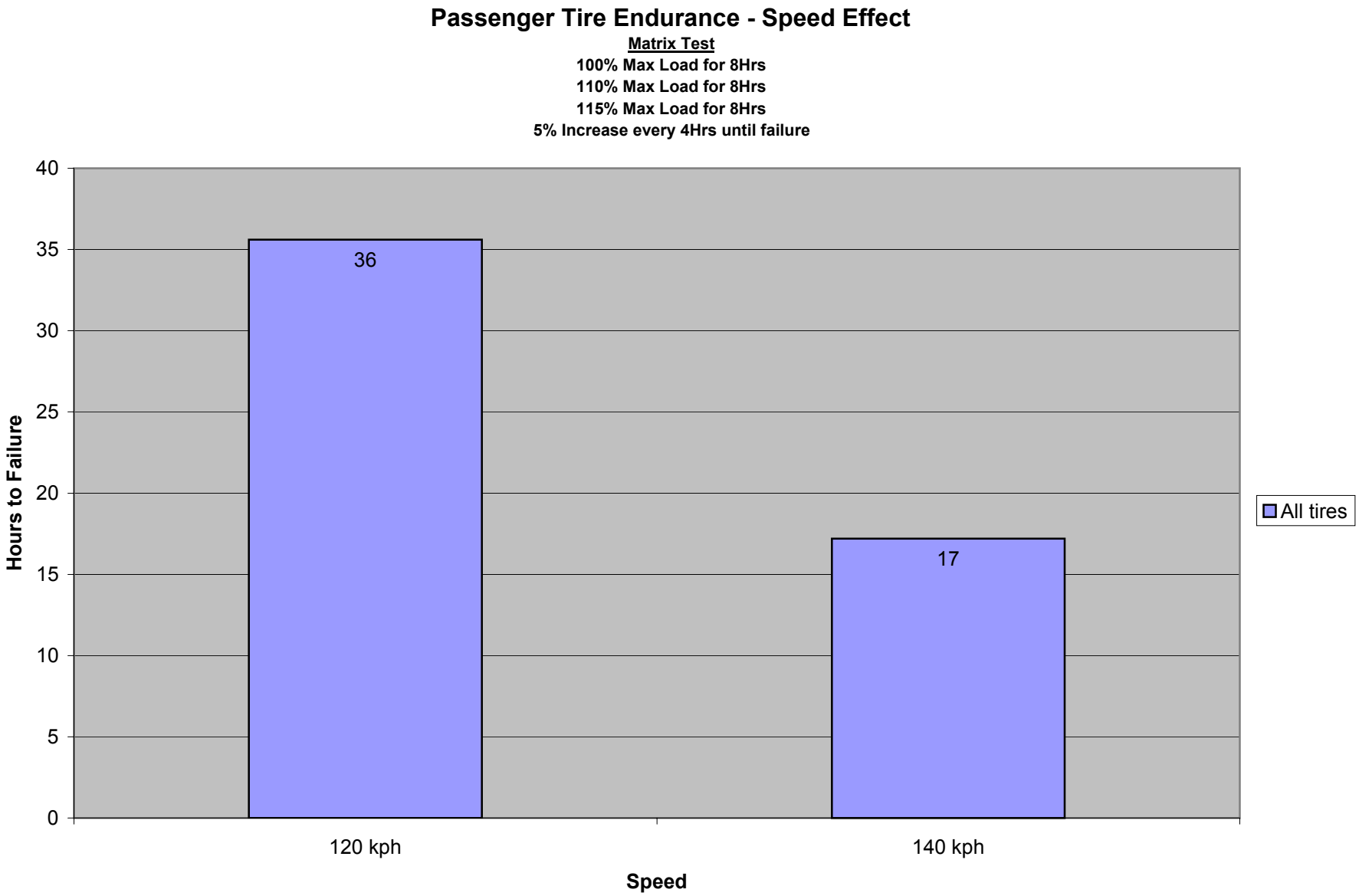
Page 2 for Test ID: P235/75R15-S-80-180-FMVSS109

Size: P235/75R15 **Test Speed (kph): 80** **Inflation(kPa): 180**

Test Condition: **Load=85% for 4hrs, 90% for 6hrs, 100% for 24hrs, then +15% for 4 hour steps to failure**

Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	205	4	62
	205	4	62
	205	2	60
	190	4	58
	190	3	57
	190	2	56
	190	2	56
	190	1	55
	175	4	54
	175	1	51
Maximum:	**205**		**62**
Minimum:	**175**		**51**
Average:			**57.1**


Passenger Tire Endurance - Pressure Effect
Matrix Test
100% Max Load for 8Hrs
110% Max Load for 8Hrs
115% Max Load for 8Hrs
5% Increase every 4Hrs until failure
Hours to Failure
35
30
25
20
15
10
5
0
22
31
160 kPa
180 kPa
Inflation Pressure
All tires


Passenger Tire Endurance - Speed Effect
Matrix Test
100% Max Load for 8Hrs
110% Max Load for 8Hrs
115% Max Load for 8Hrs
5% Increase every 4Hrs until failure
Hours to Failure
40
35
30
25
20
15
10
5
0
36
17
120 kph
140 kph
Speed
All tires

Passenger Tire Endurance Test
RMA Recommendation

- **FMVSS 109 Test (Revised)**
  - **Inflation Pressure**
    - 180 kPa
  - **Speed**
    - 120 km/h
  - **Duration**
    - Three 8 hour steps
  - **Load**
    - 8 hours at 85% max load (100% of load at test inflation)
    - 8 hours at 90% max load
    - 8 hours at 100% max load (115% of load at test inflation)
  - **Ambient Temperature**
    - 38° C ± 3° C

Light Truck Tire High Speed

RMA High Speed Test Matrix for Study on Light Truck Tires

The object of this study was to determine the failure point of selected tires under controlled conditions of ambient temperature, load, inflation pressure, speed, and duration. Two popular Light Truck tire sizes were selected for inclusion in this study. They were: LT235/75R15 Load Range C, and LT245/75R16 Load Range E. All tires tested were of Rated Speed Q, R, or S, and the test operator indicated on the data report form, under the Tire Size column, the rated speed (Q, R, or S). The SAE J1633, Laboratory Speed Test Procedure for Light Truck Tires, with the addition, beyond the specified 30-minute step, of incremental steps of 10 kph for 10 minutes each until failure occurred, was included for purposes of comparison.

For each tire size and load range tested, two tires were tested (#1 tire and #2 tire) for each and every test conducted, thus helping to eliminate anomalies. Each test tire was mounted on the test rim (test rim width tolerance of ± ½ inch) and inflated to the applicable inflation pressure without further adjustment during the test. The mounted test tires were conditioned at the ambient temperature of the test room (38^{o} C) for at least three hours.

Test conditions for load, inflation pressure, speed, duration, and ambient temperature are listed in the test matrix on the following pages. The ambient temperature for all tests was 38^{o}C. Each tire was tested at 80 and 90 percent of the maximum load marked on the sidewall, and with inflation pressures that were 1) equal to the TRA rated pressure for the size and load range, 2) equal to the rated pressure less 60 kPa, and 3) equal to the rated pressure plus 60 kPa. For the LT235/75R15 (C) tire the inflation pressures was 290 kPa, 350 kPa, and 410 kPa. For the LT245/75R16 (E) tire the inflation pressures was 490 kPa, 550 kPa, and 610 kPa. The Initial Test Speed (ITS) and the Rated Speed (RS) were measured in kilometers per hour (kph). The RS for Q rated tires is 160 kph, for R rated tires it is 170 kph, and for S rated tires it is 180 kph. The ITS was equal to RS less 20 kph. The test proceeded through the following incremental speed increases using three ten-minute steps and one thirty-minute step for a total of one hour.

Speed steps for ITS = RS – 20 kph

Speed step	0 kph to ITS	for 10 minutes
Speed step	ITS	for 10 minutes
Speed step	ITS plus10 kph	for 10 minutes
Speed step	ITS plus 20 kph	for 30 minutes

TOTAL TIME 60 MINUTES

The test operator recorded the failure point of each test tire in terms of the number of minutes run during the step at which failure occurs. This number ranged from 0 to 10 minutes, except in the case of the one 30-minute step where the number ranged from 0 to 30 minutes.

In the example table shown below, if the number 1 test tire, LT235/75R15 (C), Rated Speed of Q or 160 kph, failed during the 8th minute of the ITS plus 10 duration step, the result would have been recorded as 8 minutes at 150 kph. Similarly, if the number two tire for this same test failed during the 22nd minute of the 30-minute, ITS plus 20 kph, duration step the result would have been recorded as 22 minutes at 160 kph.

If there was no tire failure at the end of the one-hour test routine, then the operator continued the test regimen by subjecting the tire to additional speed increases of 10 kilometer/hour increments for 10-minute durations until failure did occur. In the example below, if the number one test tire for LT245/75R16(E), Rated Speed of S or 180 kph, completed the full one-hour test regime and then continued on for an additional speed increase step, failing in the 7th minute of the ITS plus 30 step, the result would have been recorded as: 7 minutes at 190 kph. Similarly, if the number two tire on the same test continued on for two additional step increases beyond one hour and failed during the 5th minute of the second or ITS plus 40 step, the result would have been recorded as 5 minutes at 200 kph.

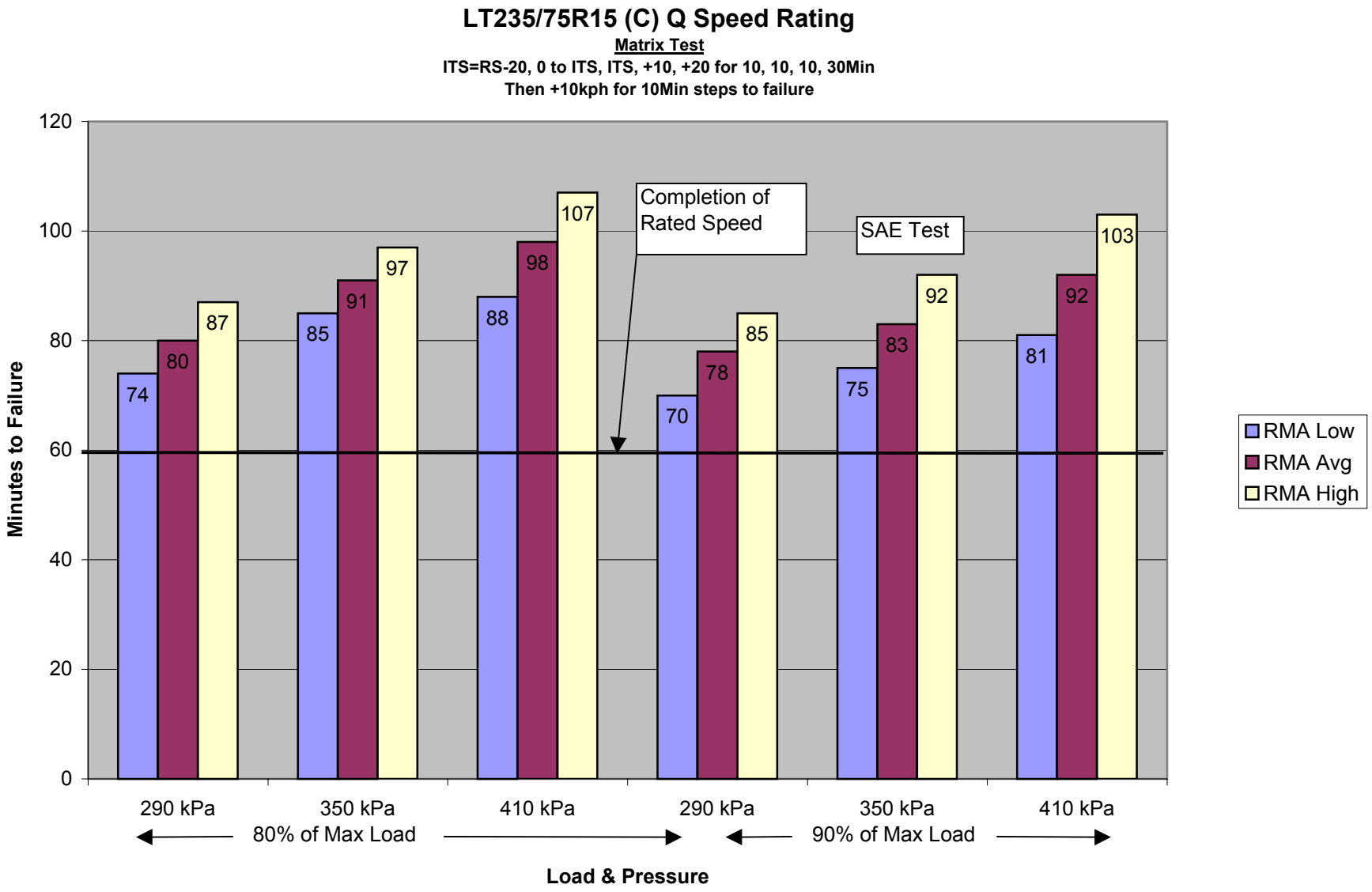
Example of Completed Test Data

TIRE SIZE	**LOAD** (%)	**INFLATION** (kPa)	**SPEED** (kph) (ITS = Initial Test Speed RS = Rated Speed)	**DURATION** (Minutes)	**AMBIENT TEMP.** (^{o} Celsius)	**TOTAL TIME** (Hours)	**FAILURE** (Minutes @ Speed in kph)
LT235/75R15 (C) *(indicate RS = **Q**, R, or S)*	90	290	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire *8 min @ 150 kph* #2 tire *22 min @ 160 kph*
LT245/75R16 (E) *(indicate RS = Q, R, or **S**)*	90	550	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire *7 min @ 190 kph* #2 tire *5 min @ 200 kph2*

On the following pages is the test matrix.

TIRE SIZE	**LOAD** (%)	**INFLATION** (kPa)	**SPEED** (kph) (ITS = Initial Test Speed RS = Rated Speed)	**DURATION** (Minutes)	**AMBIENT TEMP.** (^{o} C)	**TOTAL TIME** (Hours)	**FAILURE** (Minutes @ Speed in kph)
LT235/75R15 (C) *indicate* *RS = Q, R, or S*	80	290	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire
	80	350	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire
	80	410	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire
	90	290	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire
	90	350	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure) **will serve as SAE J1633 Test**	10, 10, 10, 30	38	1	#1 tire #2 tire
	90	410	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire

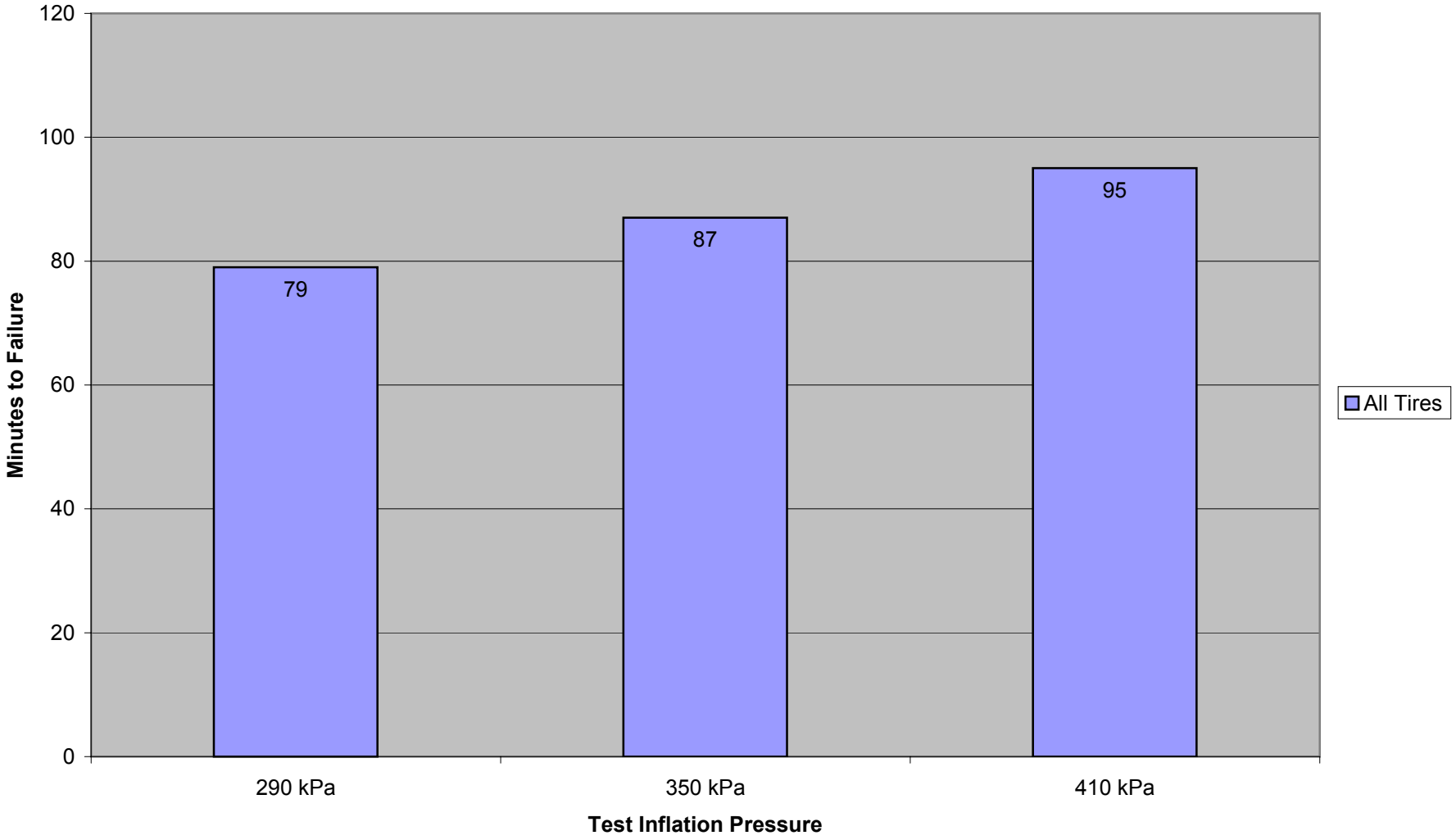
TIRE SIZE	**LOAD** (%)	**INFLATION** (kPa)	**SPEED** (kph**)** (ITS = Initial Test Speed RS = Rated Speed)	**DURATION** (Minutes)	**AMBIENT TEMP.** (^{o} C)	**TOTAL TIME** (Hours)	**FAILURE** (Minutes @ Speed in kph)
LT245/75R16 (E) *indicate* *RS = Q, R, or S*	80	490	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire
	80	550	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire
	80	610	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire
	90	490	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire
	90	550	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure) **will serve as SAE J1633 Test**	10, 10, 10, 30	38	1	#1 tire #2 tire
	90	610	ITS = RS – 20 0 to ITS, ITS, +10 +20 (+10kph for 10 min steps to failure)	10, 10, 10, 30	38	1	#1 tire #2 tire


LT235/75R15 (C) Q Speed Rating
Matrix Test
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure
Minutes to Failure
120
100
80
60
40
20
0
Completion of Rated Speed
SAE Test
74
80
87
85
91
97
88
98
107
70
78
85
75
83
92
81
92
103
290 kPa
350 kPa
410 kPa
290 kPa
350 kPa
410 kPa
80% of Max Load
90% of Max Load
Load & Pressure
RMA Low
RMA Avg
RMA High

Light Truck High Speed - LT235/75R15 (C) Q - Pressure Effect

Matrix Test

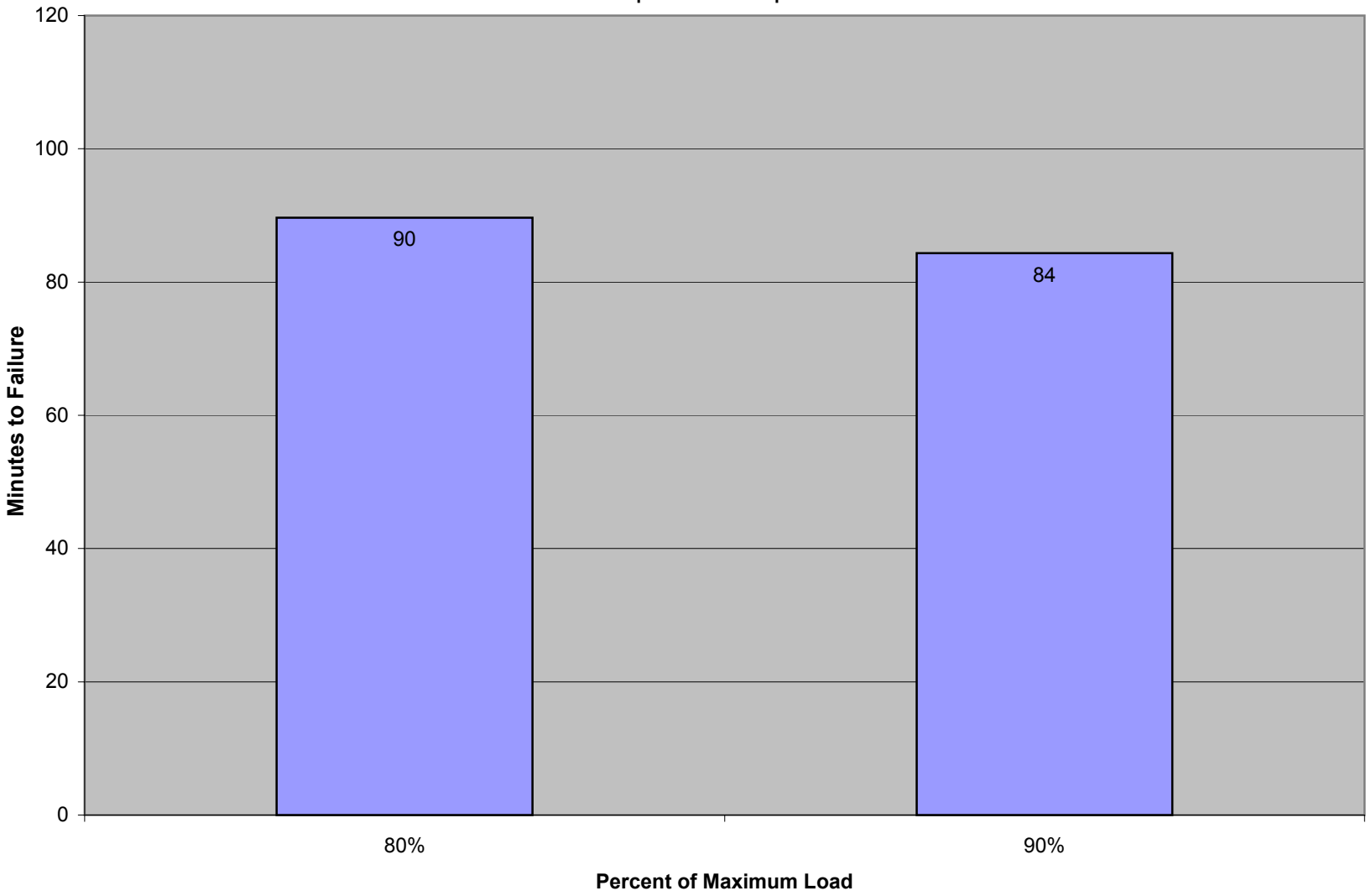
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure



Light Truck High Speed - LT235/75R15 (C) Q Speed Rating - Load Effect

Matrix Test

ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure

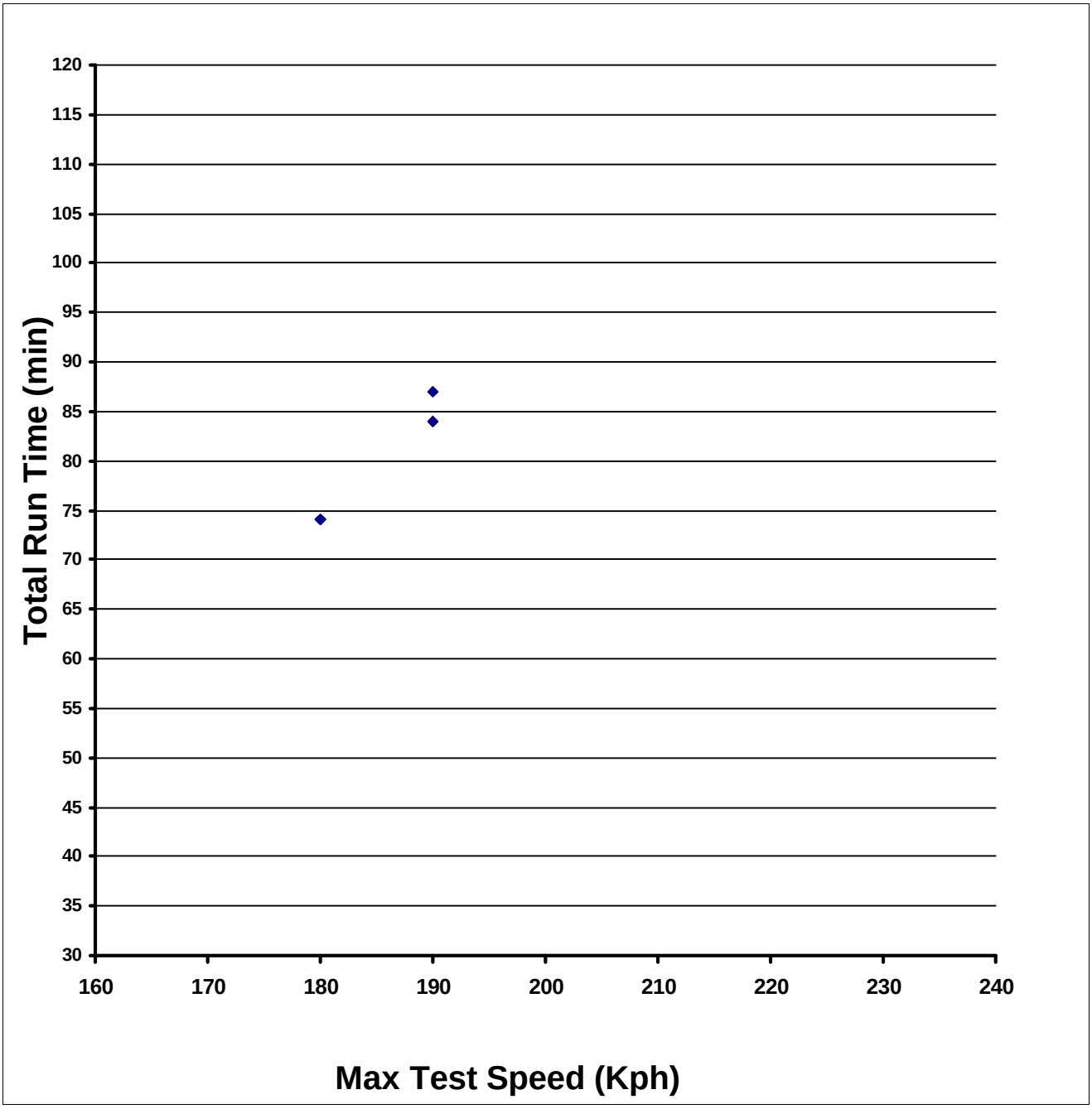


Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-Q-80-290-B-RMA

Size: LT235/75R15(C) Speed: Q Load (%) 80 Inflation(kPa): 290

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-Q-80-290-B-RMA

Size: LT235/75R15(C) **Speed: Q** **Load(%) 80** **Inflation(kPa): 290**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

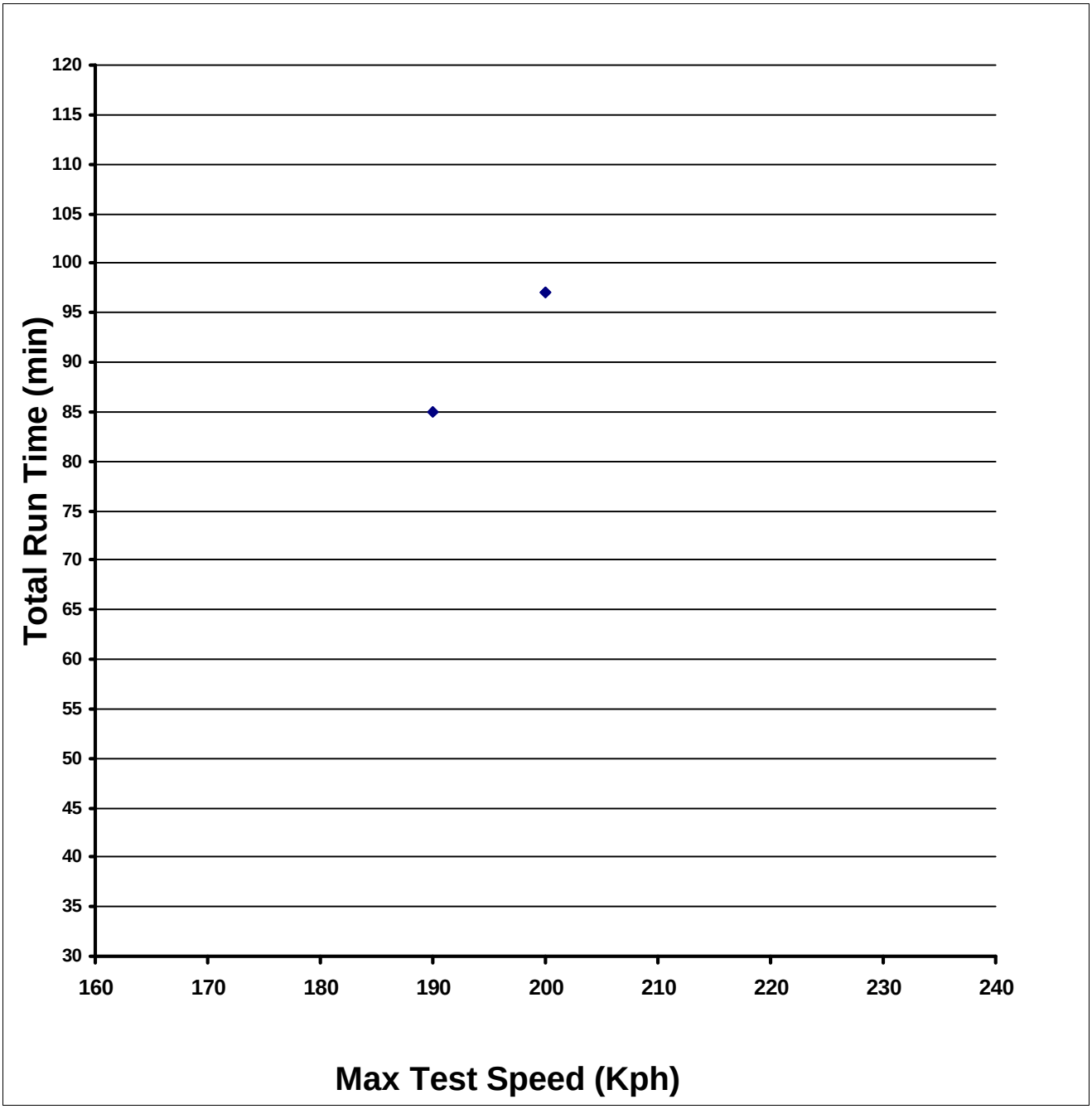
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	190	7	87
	190	4	84
	180	4	74
	180	4	74
Maximum:	**190**		**87**
Minimum:	**180**		**74**
Average:			**79.75**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-Q-80-350-B-RMA

Size: LT235/75R15(C) Speed: Q Load (%) 80 Inflation(kPa): 350

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-Q-80-350-B-RMA

Size: LT235/75R15(C) **Speed: Q** **Load(%) 80** **Inflation(kPa): 350**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

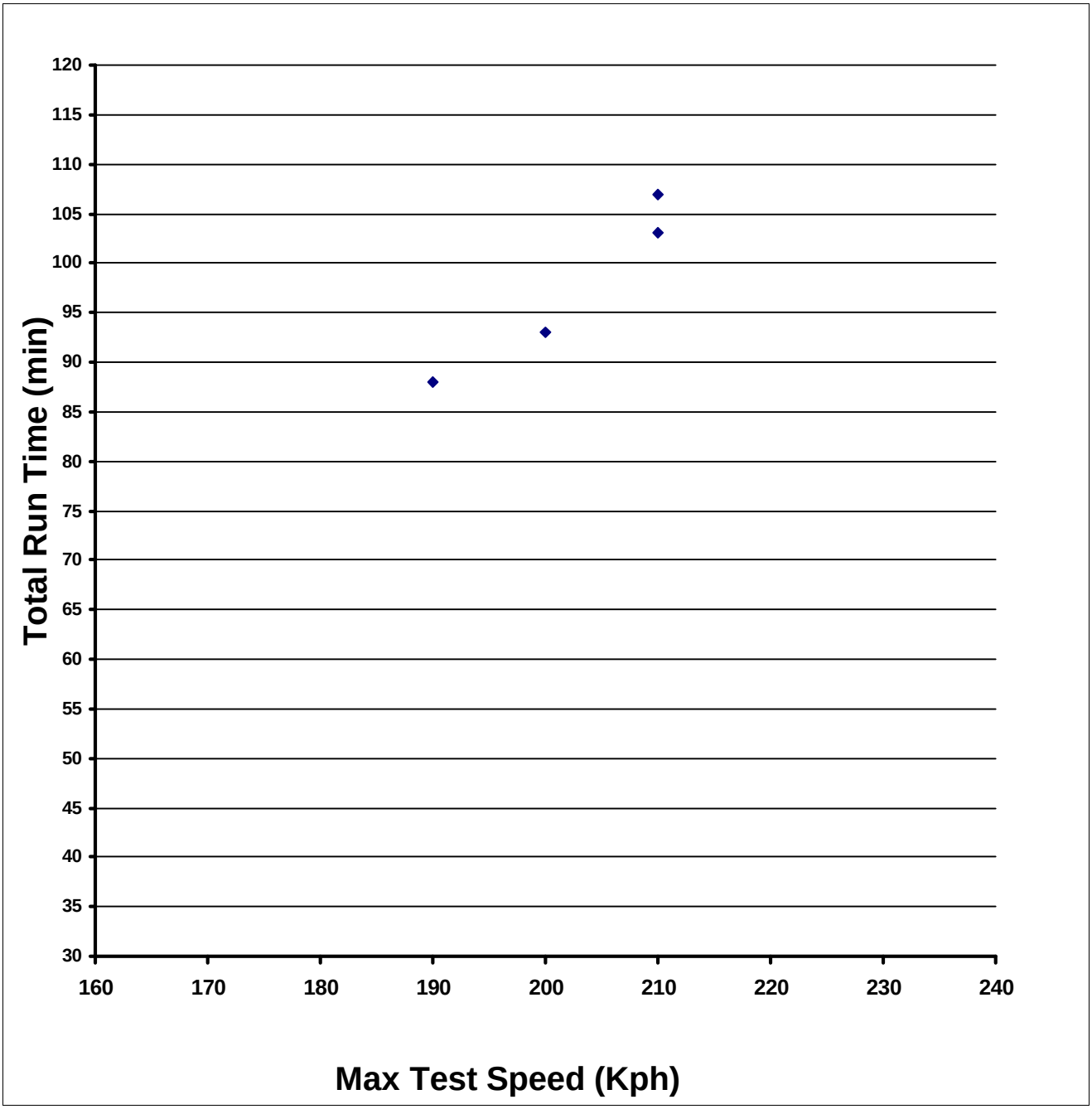
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	200	7	97
	200	7	97
	190	5	85
	190	5	85
Maximum:	**200**		**97**
Minimum:	**190**		**85**
Average:			**91**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-Q-80-410-B-RMA

Size: LT235/75R15(C) Speed: Q Load (%) 80 Inflation(kPa): 410

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-Q-80-410-B-RMA

Size: LT235/75R15(C) **Speed: Q** **Load(%) 80** **Inflation(kPa): 410**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

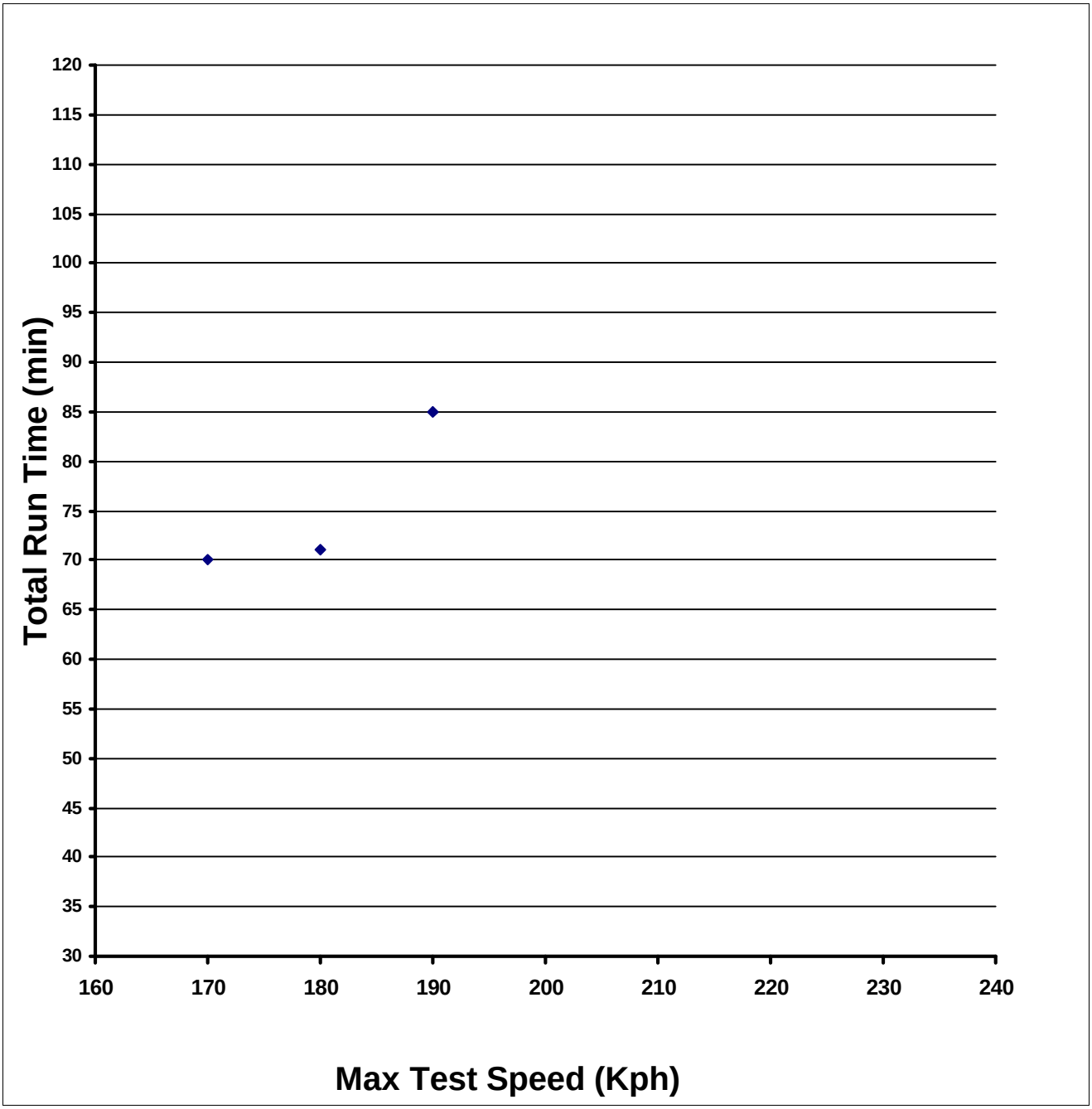
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	7	107
	210	3	103
	200	3	93
	190	8	88
Maximum:	**210**		**107**
Minimum:	**190**		**88**
Average:			**97.75**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-Q-90-290-B-RMA

Size: LT235/75R15(C) Speed: Q Load (%) 90 Inflation(kPa): 290

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-Q-90-290-B-RMA

Size: LT235/75R15(C) **Speed: Q** **Load(%) 90** **Inflation(kPa): 290**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

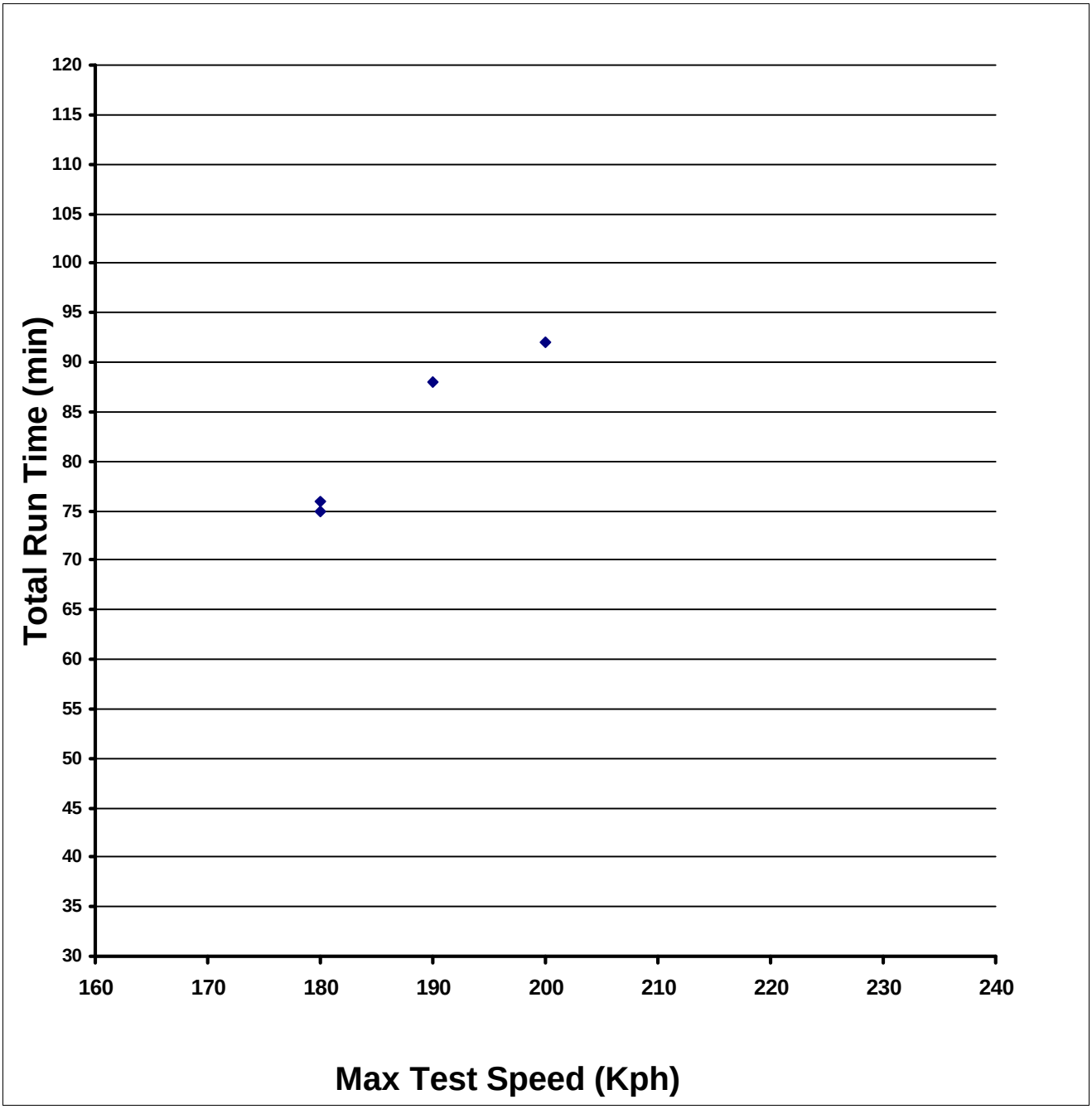
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	190	5	85
	190	5	85
	180	1	71
	170	10	70
Maximum:	**190**		**85**
Minimum:	**170**		**70**
Average:			**77.75**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-Q-90-350-B-SAE J1633

Size: LT235/75R15(C) Speed: Q Load (%) 90 Inflation(kPa): 350

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-Q-90-350-B-SAE J1633

Size: LT235/75R15(C) **Speed: Q** **Load(%) 90** **Inflation(kPa): 350**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

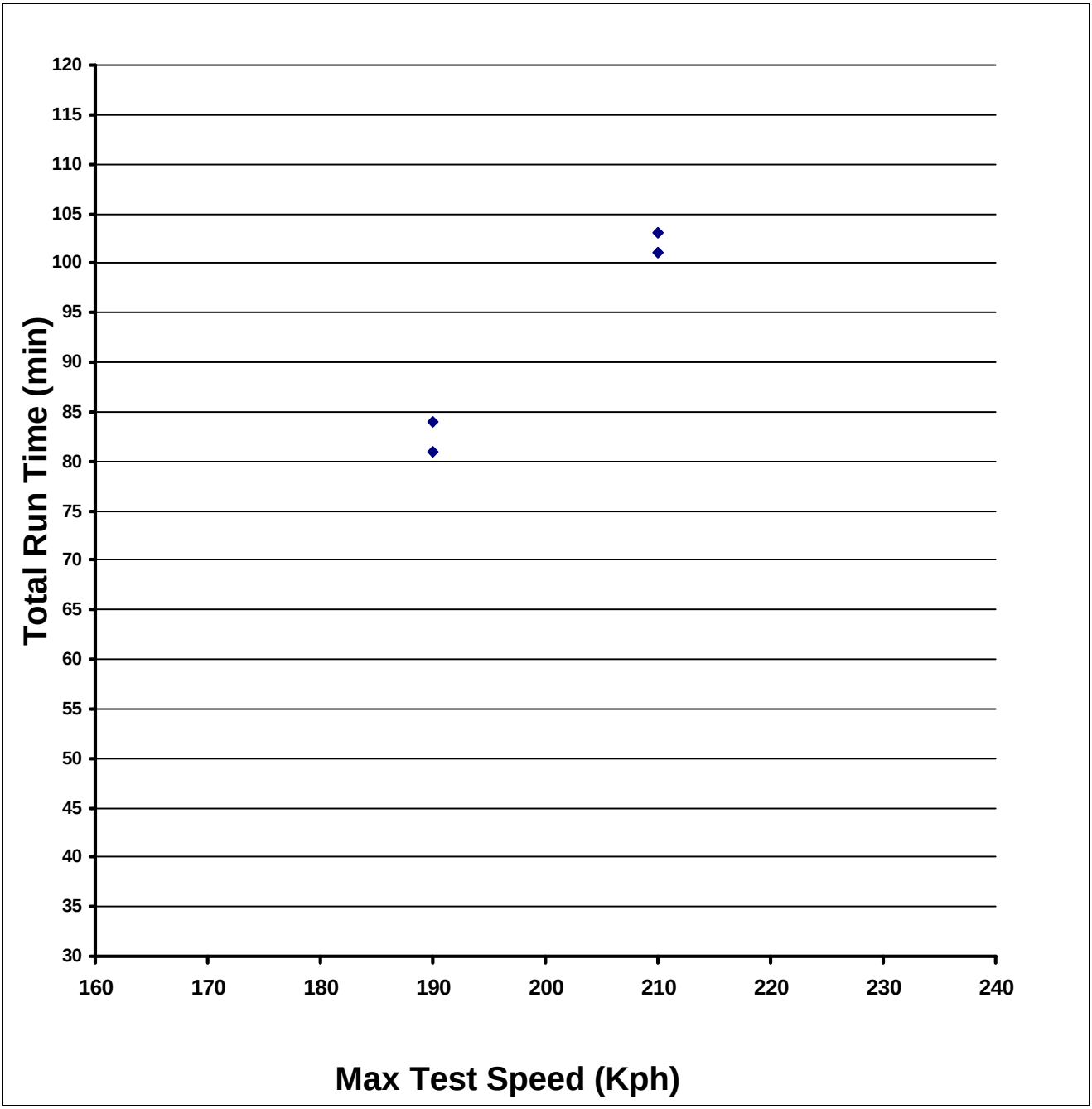
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	200	2	92
	190	8	88
	180	6	76
	180	5	75
Maximum:	**200**		**92**
Minimum:	**180**		**75**
Average:			**82.75**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-Q-90-410-B-RMA

Size: LT235/75R15(C) Speed: Q Load (%) 90 Inflation(kPa): 410

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



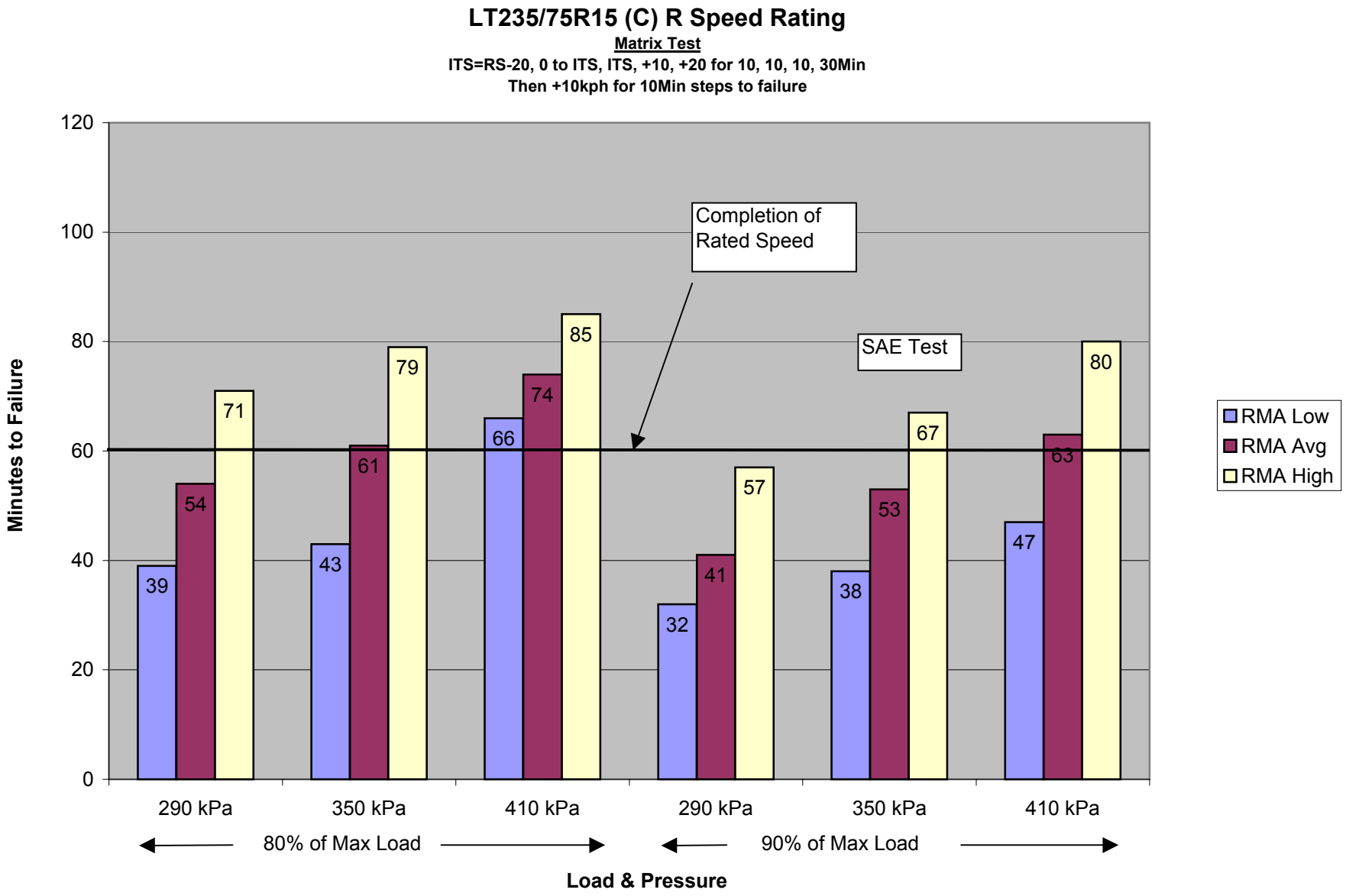
Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-Q-90-410-B-RMA

Size: LT235/75R15(C) **Speed: Q** **Load(%) 90** **Inflation(kPa): 410**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

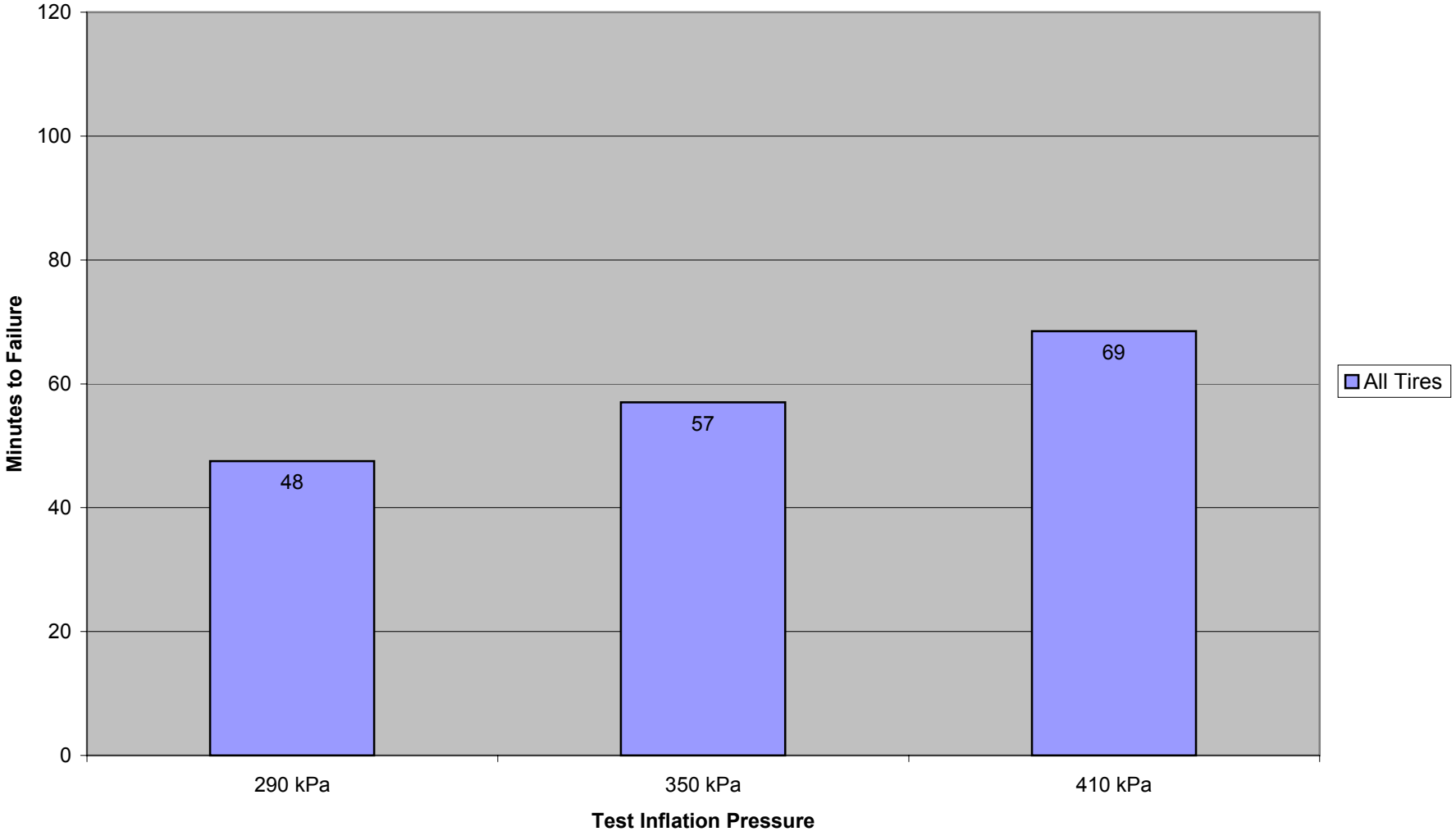
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	3	103
	210	1	101
	190	4	84
	190	1	81
Maximum:	**210**		**103**
Minimum:	**190**		**81**
Average:			**92.25**


LT235/75R15 (C) R Speed Rating
Matrix Test
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure
Minutes to Failure
120
100
80
60
40
20
0
Completion of Rated Speed
SAE Test
39
54
71
43
61
79
66
74
85
32
41
57
38
53
67
47
63
80
290 kPa
350 kPa
410 kPa
290 kPa
350 kPa
410 kPa
80% of Max Load
90% of Max Load
Load & Pressure
RMA Low
RMA Avg
RMA High

Light Truck High Speed - LT235/75R15 (C) R - Pressure Effect

Matrix Test

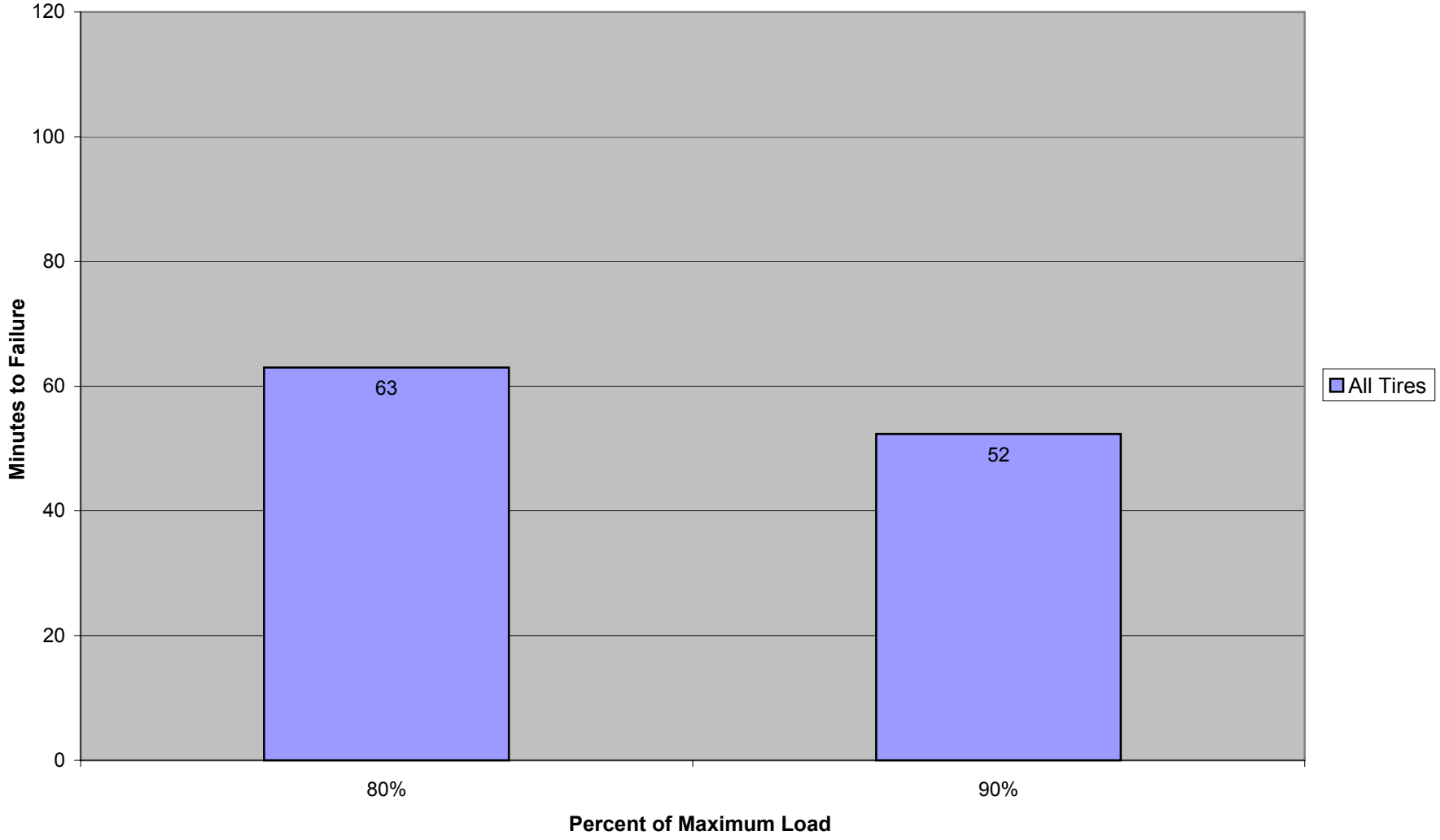
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure



Light Truck High Speed - LT235/75R15 (C) R Speed Rating - Load Effect

Matrix Test

ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure

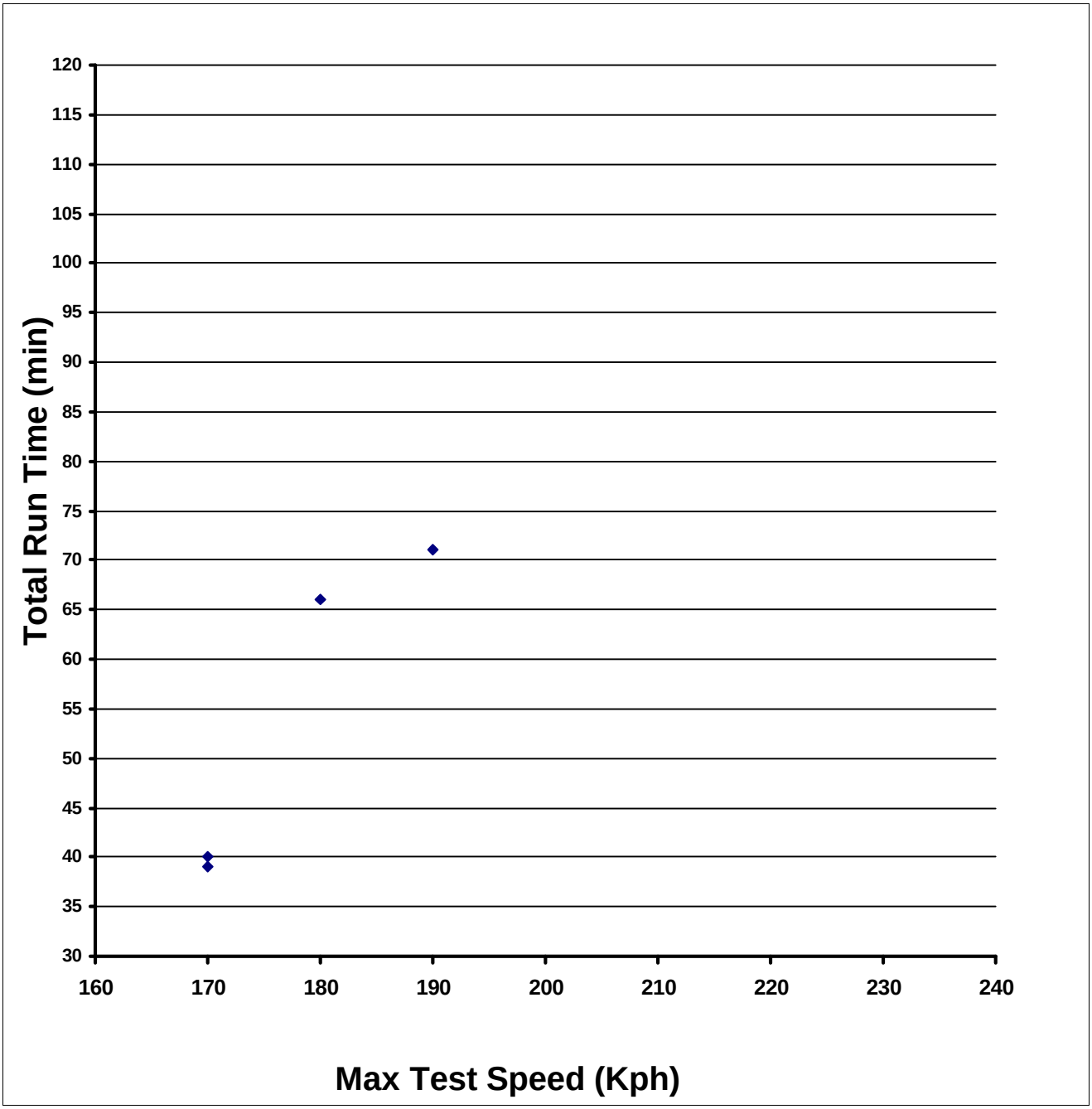


Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-R-80-290-B-RMA

Size: LT235/75R15(C) Speed: R Load (%) 80 Inflation(kPa): 290

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-R-80-290-B-RMA

Size: LT235/75R15(C) Speed: R Load(%) 80 Inflation(kPa): 290

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

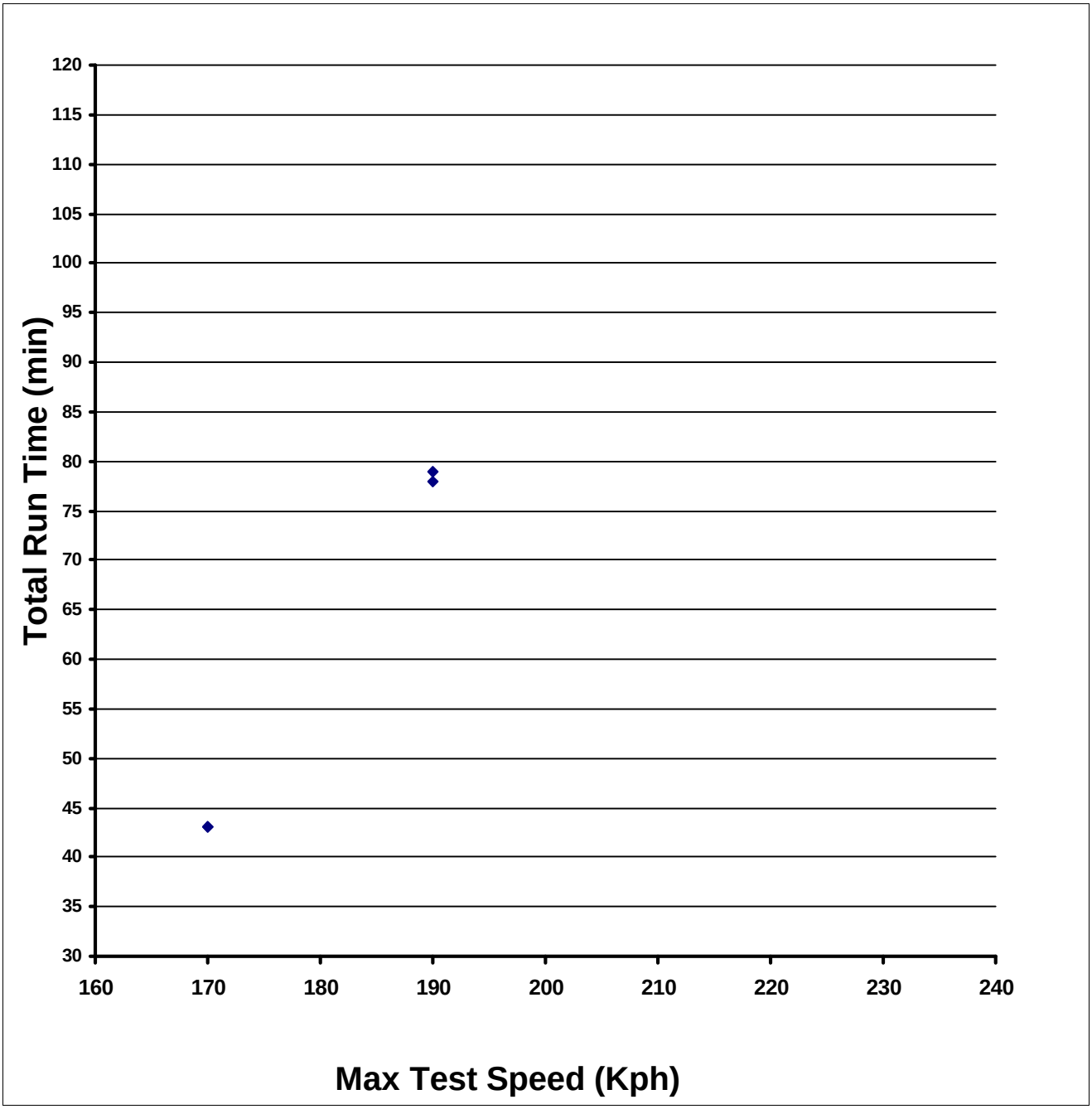
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	190	1	71
	180	6	66
	170	10	40
	170	9	39
Maximum:	**190**		**71**
Minimum:	**170**		**39**
Average:			**54**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-R-80-350-B-RMA

Size: LT235/75R15(C) Speed: R Load (%) 80 Inflation(kPa): 350

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-R-80-350-B-RMA

Size: LT235/75R15(C) **Speed: R** **Load(%) 80** **Inflation(kPa): 350**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

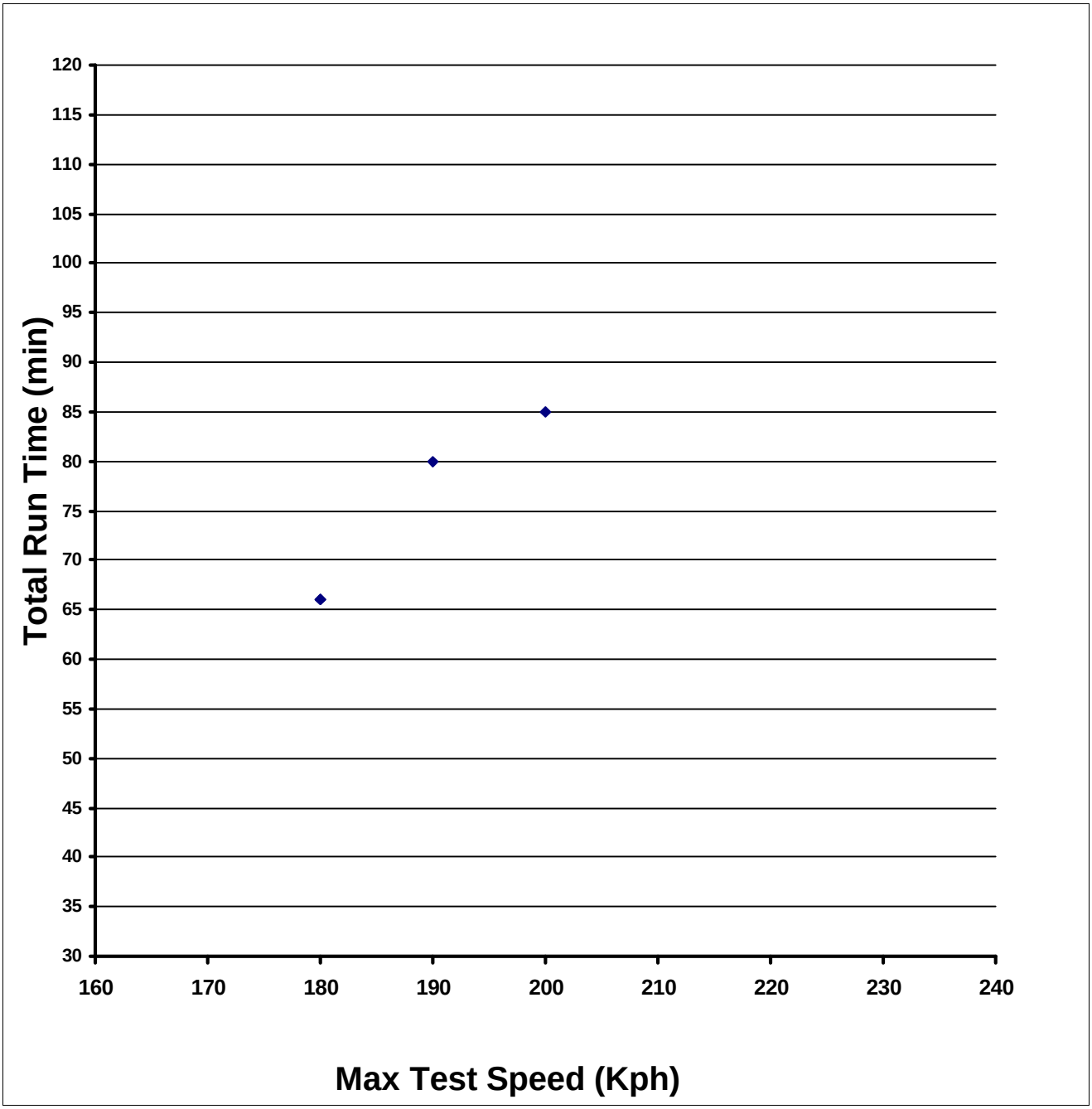
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	190	9	79
	190	8	78
	170	13	43
	170	13	43
Maximum:	**190**		**79**
Minimum:	**170**		**43**
Average:			**60.75**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-R-80-410-B-RMA

Size: LT235/75R15(C) Speed: R Load (%) 80 Inflation(kPa): 410

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-R-80-410-B-RMA

Size: LT235/75R15(C) **Speed: R** **Load(%) 80** **Inflation(kPa): 410**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

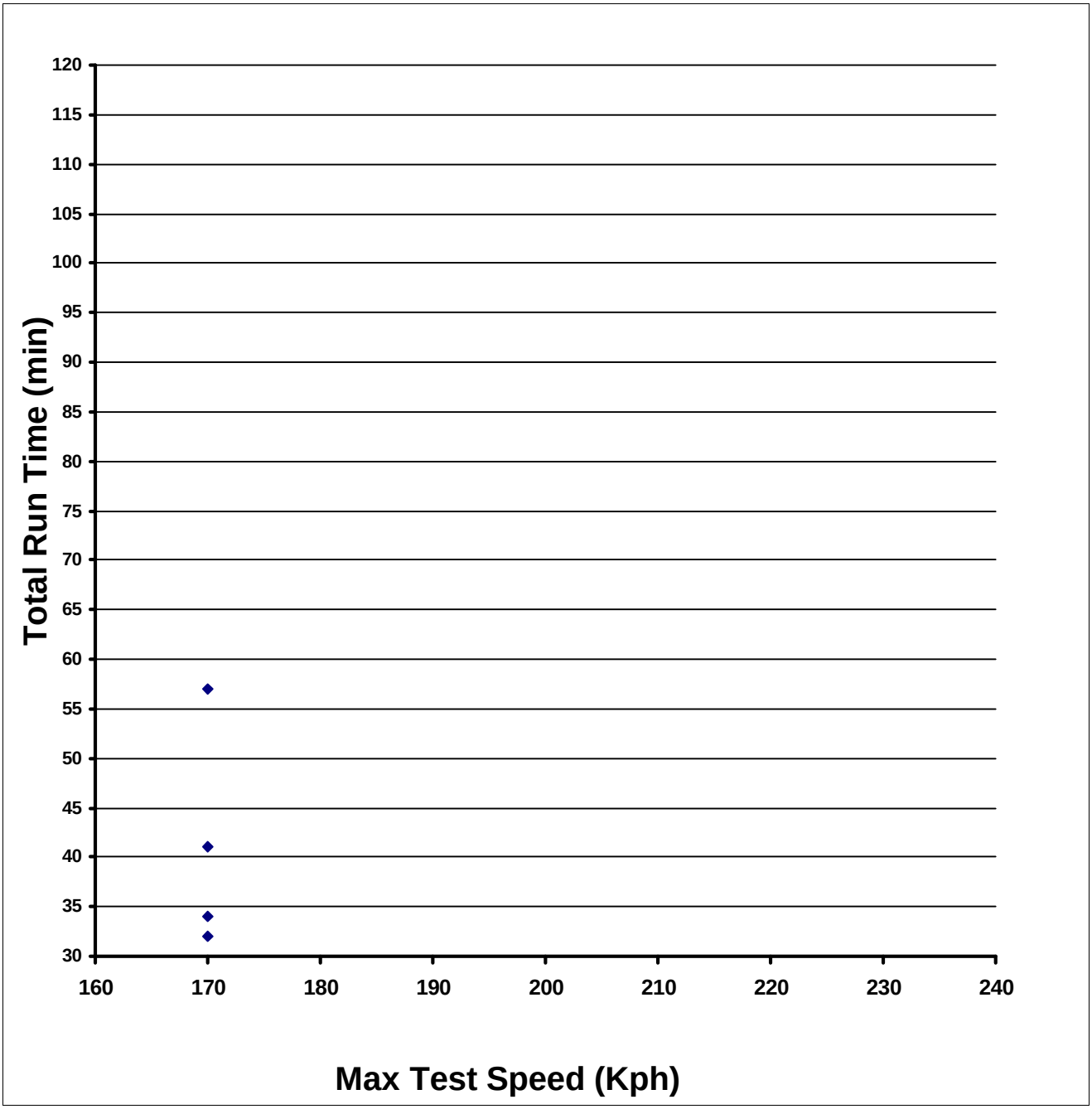
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	200	5	85
	190	10	80
	180	6	66
	180	6	66
Maximum:	**200**		**85**
Minimum:	**180**		**66**
Average:			**74.25**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-R-90-290-B-RMA

Size: LT235/75R15(C) Speed: R Load (%) 90 Inflation(kPa): 290

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-R-90-290-B-RMA

Size: LT235/75R15(C) Speed: R Load(%) 90 Inflation(kPa): 290

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

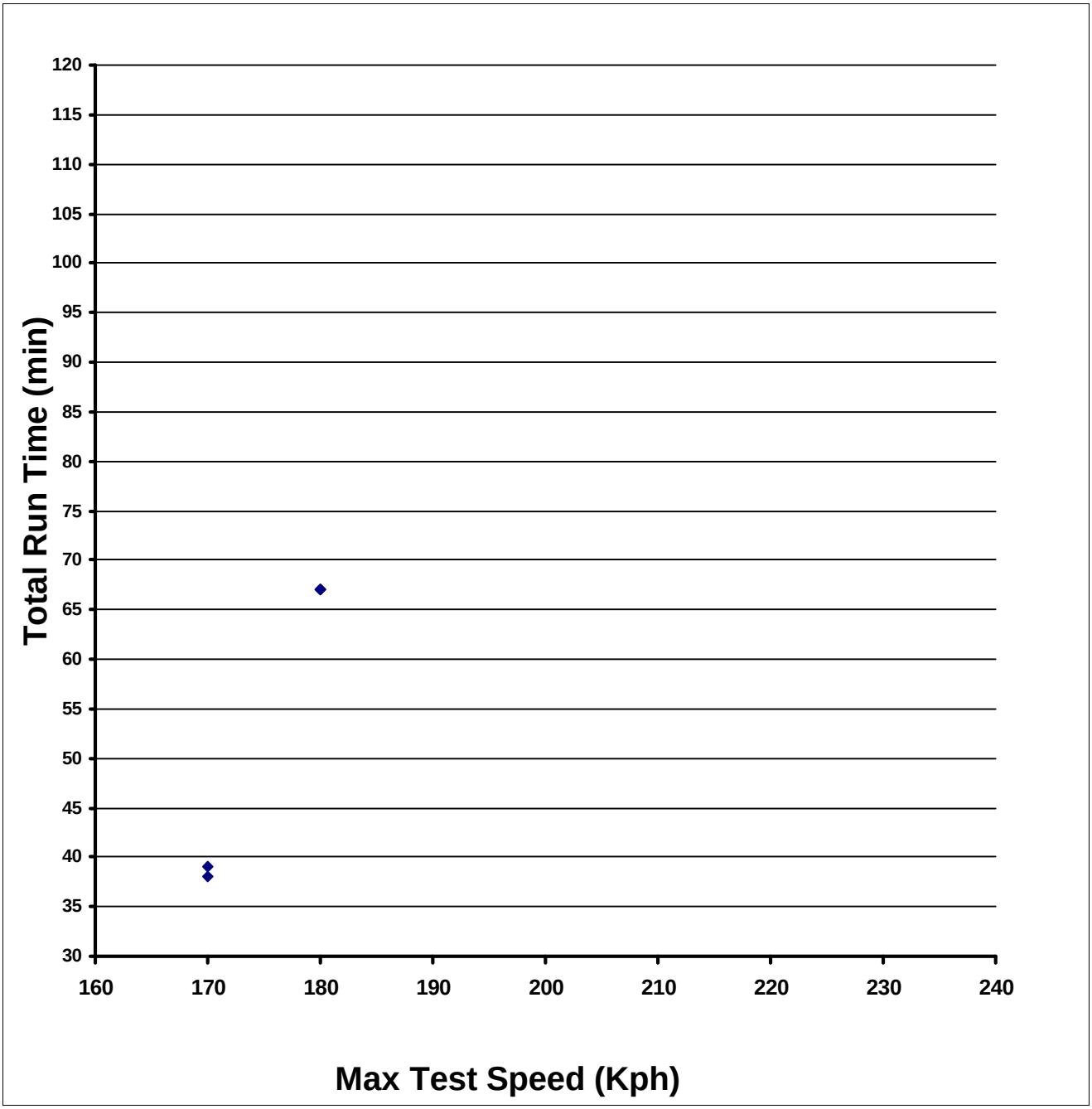
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	170	27	57
	170	11	41
	170	4	34
	170	2	32
Maximum:	**170**		**57**
Minimum:	**170**		**32**
Average:			**41**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-R-90-350-B-SAE J1633

Size: LT235/75R15(C) Speed: R Load (%) 90 Inflation(kPa): 350

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-R-90-350-B-SAE J1633

Size: LT235/75R15(C) **Speed: R** **Load(%) 90** **Inflation(kPa): 350**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

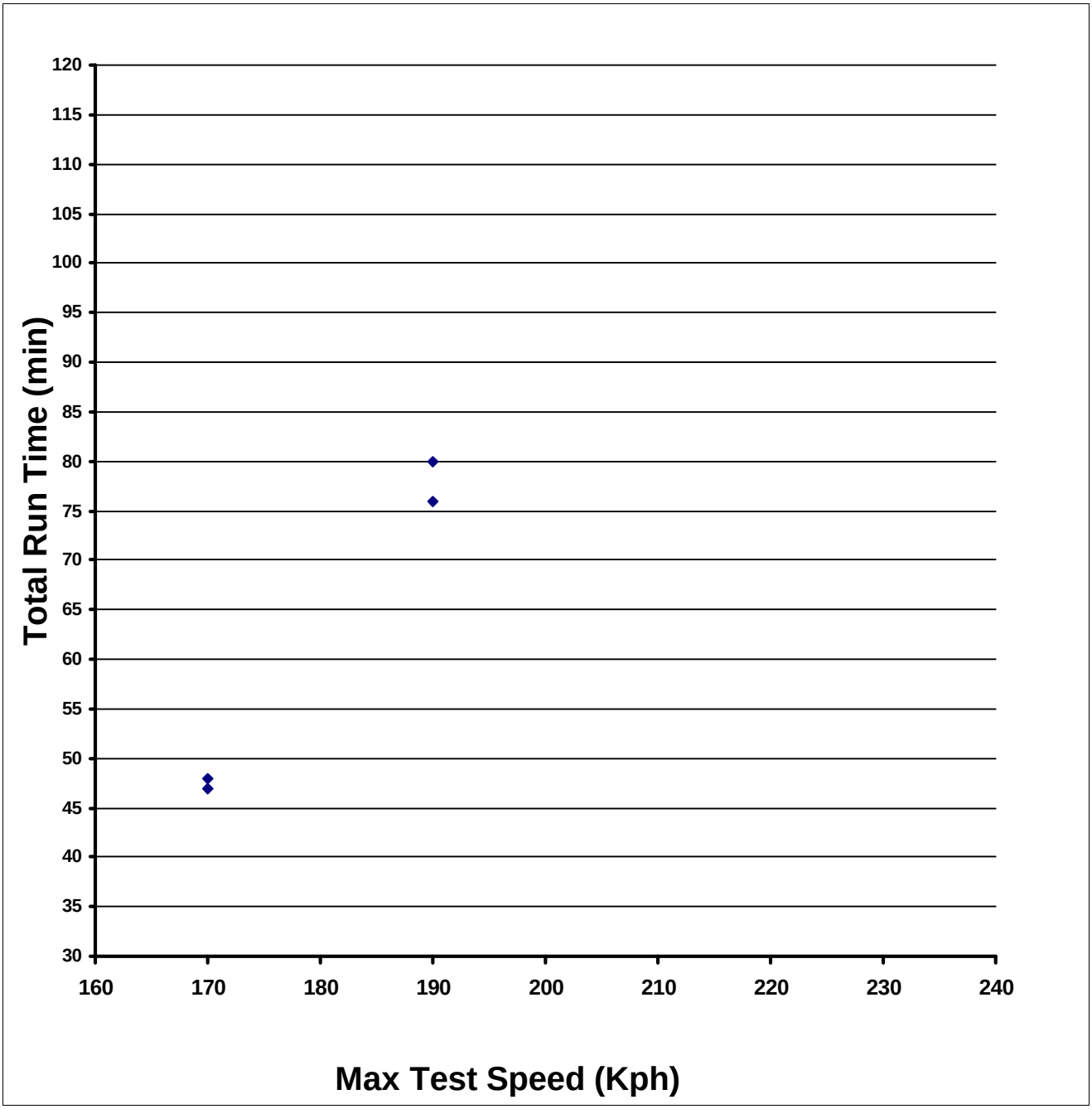
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	180	7	67
	180	7	67
	170	9	39
	170	8	38
Maximum:	**180**		**67**
Minimum:	**170**		**38**
Average:			**52.75**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-R-90-410-B-RMA

Size: LT235/75R15(C) Speed: R Load (%) 90 Inflation(kPa): 410

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



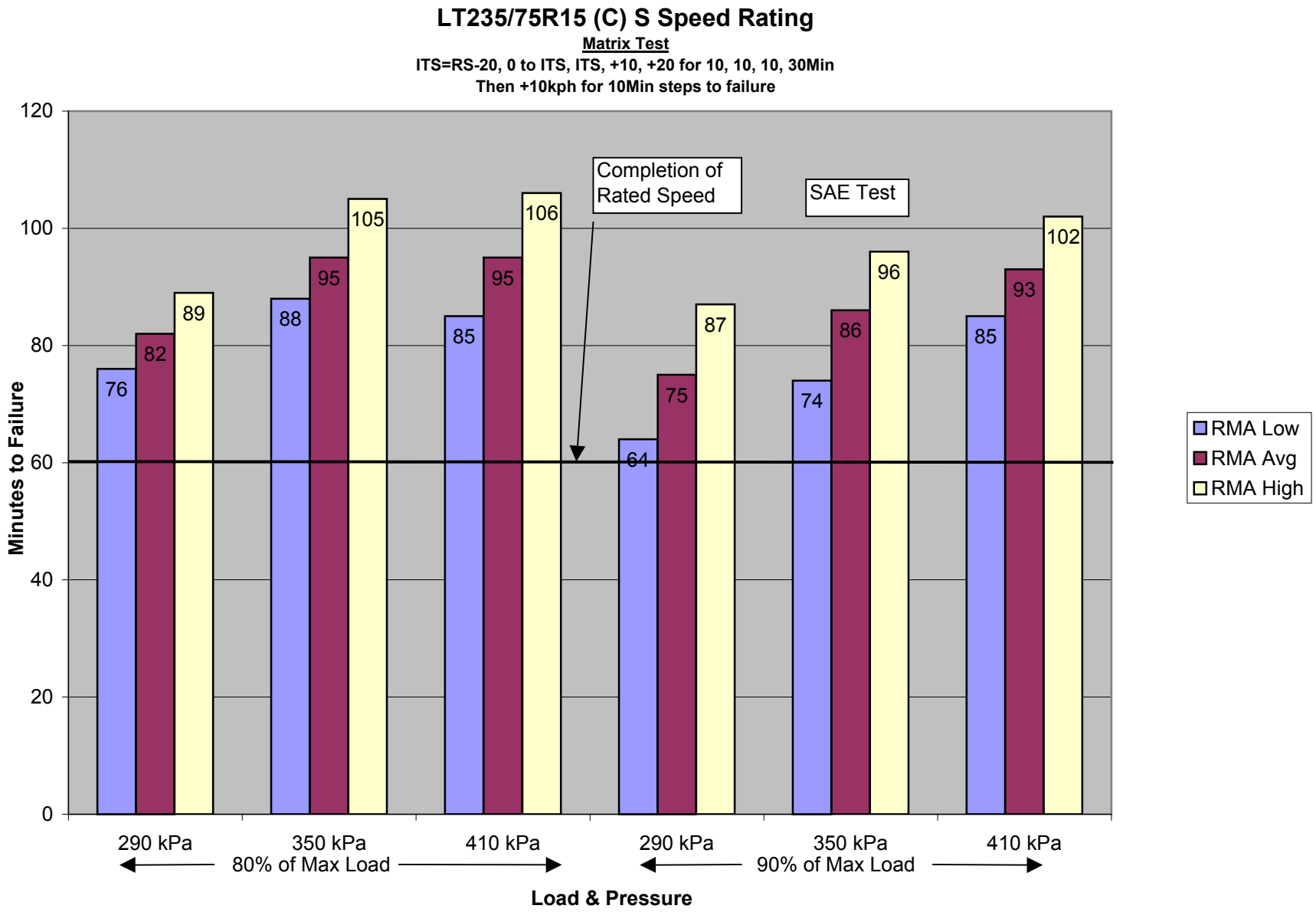
Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-R-90-410-B-RMA

Size: LT235/75R15(C) **Speed: R** **Load(%) 90** **Inflation(kPa): 410**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

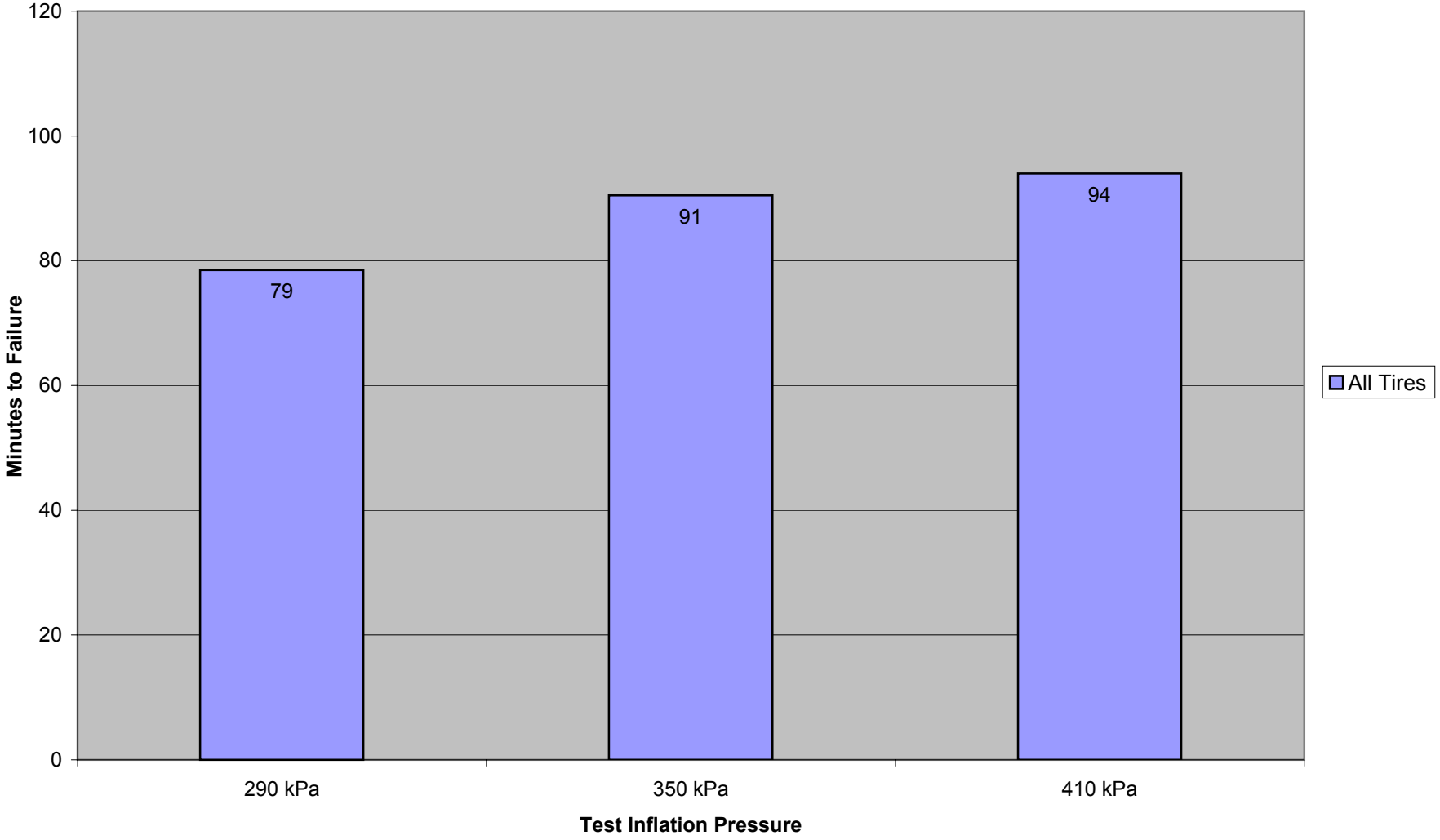
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	190	10	80
	190	6	76
	170	18	48
	170	17	47
Maximum:	**190**		**80**
Minimum:	**170**		**47**
Average:			**62.75**


LT235/75R15 (C) S Speed Rating
Matrix Test
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure
Minutes to Failure
120
100
80
60
40
20
0
Completion of Rated Speed
SAE Test
76
82
89
88
95
105
85
95
106
64
75
87
74
86
96
85
93
102
290 kPa
350 kPa
410 kPa
290 kPa
350 kPa
410 kPa
80% of Max Load
90% of Max Load
Load & Pressure
RMA Low
RMA Avg
RMA High

Light Truck High Speed - LT235/75R15 (C) S - Pressure Effect

Matrix Test

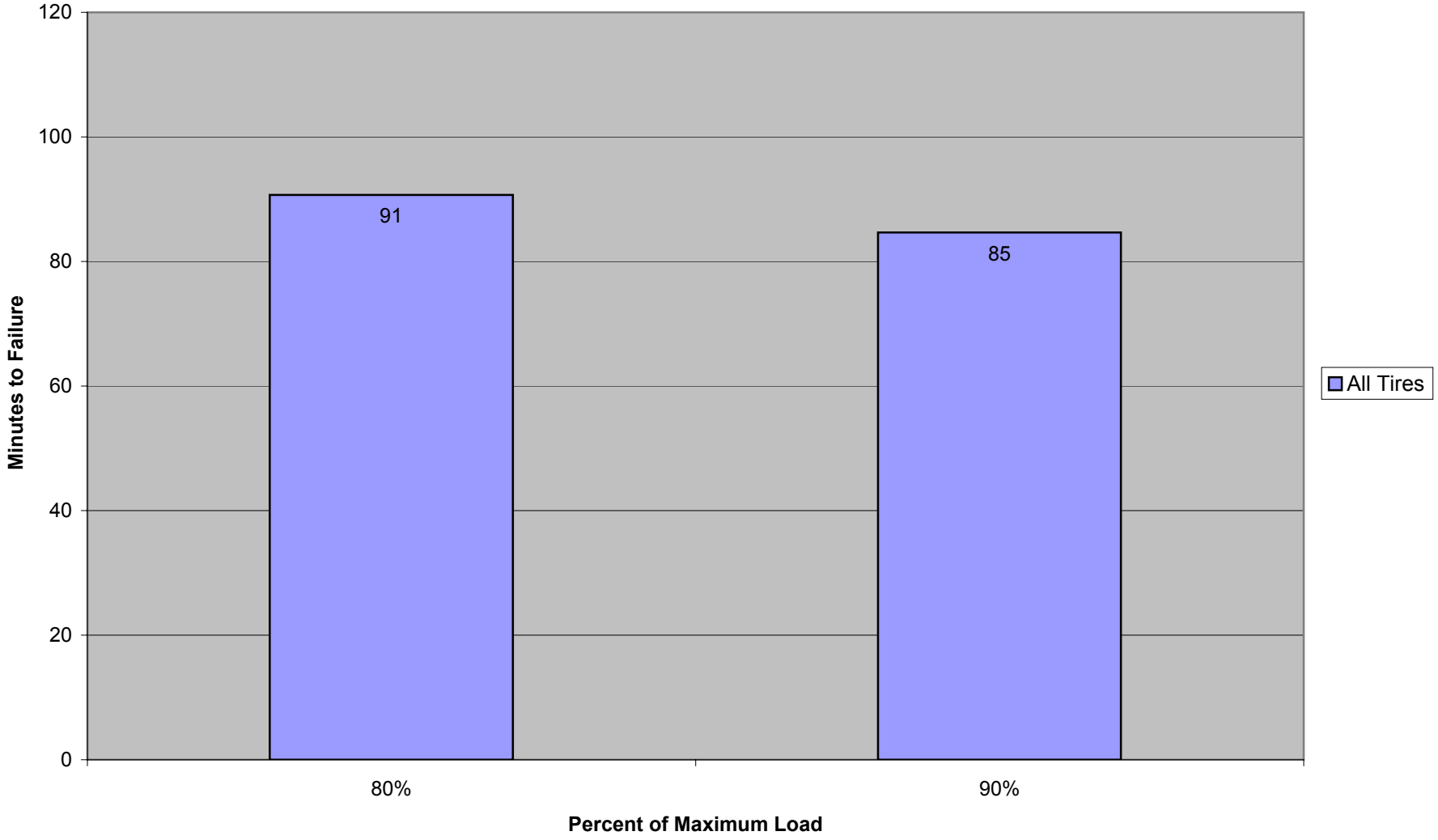
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure



Light Truck High Speed - LT235/75R15 (C) S Speed Rating - Load Effect

Matrix Test

ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure

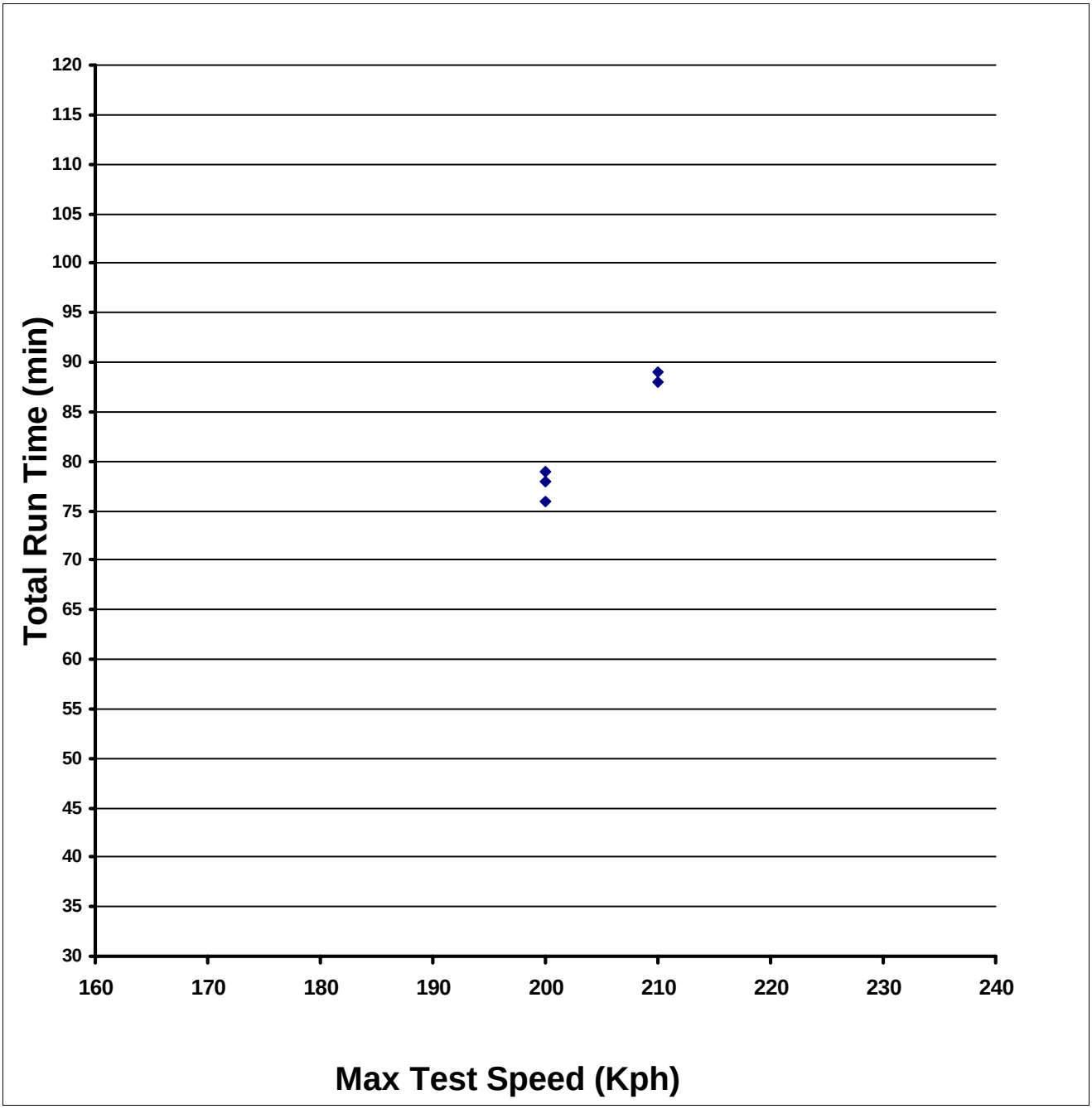


Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-S-80-290-B-RMA

Size: LT235/75R15(C) Speed: S Load (%) 80 Inflation(kPa): 290

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-S-80-290-B-RMA

Size: LT235/75R15(C) Speed: S Load(%) 80 Inflation(kPa): 290

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

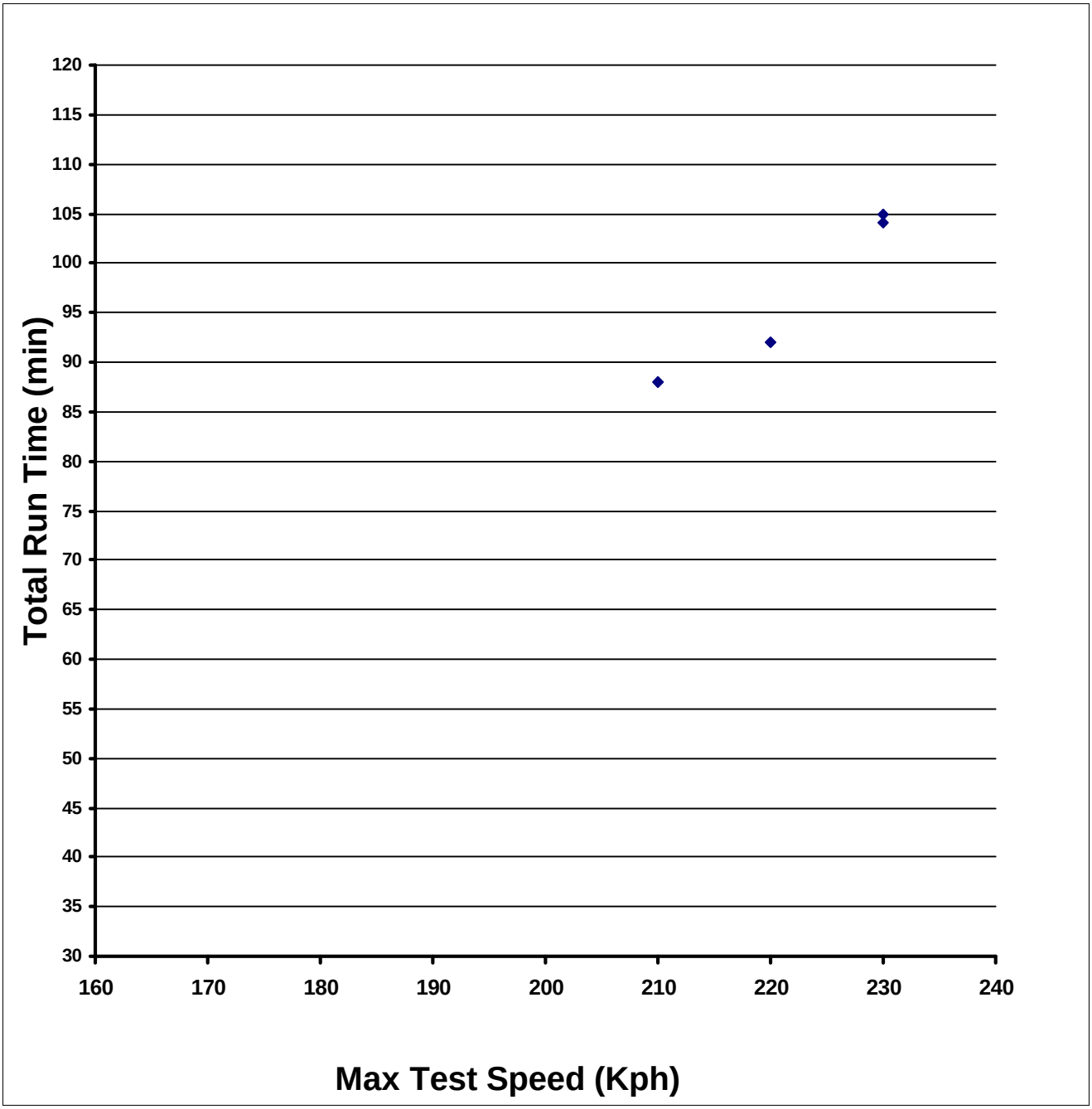
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	9	89
	210	8	88
	200	9	79
	200	8	78
	200	6	76
Maximum:	**210**		**89**
Minimum:	**200**		**76**
Average:			**82**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-S-80-350-B-RMA

Size: LT235/75R15(C) Speed: S Load (%) 80 Inflation(kPa): 350

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-S-80-350-B-RMA

Size: LT235/75R15(C) **Speed: S** **Load(%) 80** **Inflation(kPa): 350**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

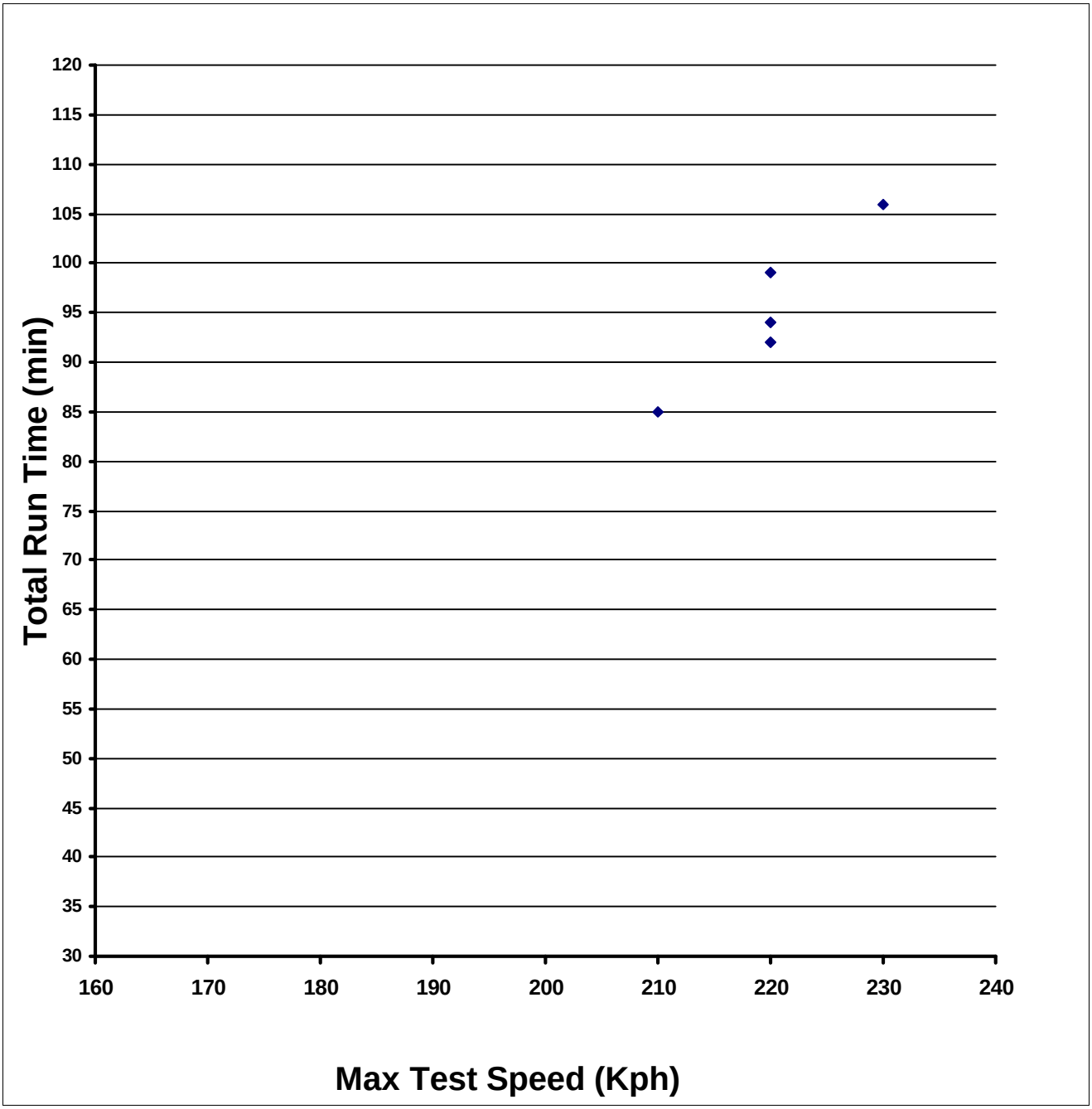
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	230	5	105
	230	4	104
	220	2	92
	210	8	88
	210	8	88
Maximum:	**230**		**105**
Minimum:	**210**		**88**
Average:			**95.4**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-S-80-410-B-RMA

Size: LT235/75R15(C) Speed: S Load (%) 80 Inflation(kPa): 410

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-S-80-410-B-RMA

Size: LT235/75R15(C) **Speed: S** **Load(%) 80** **Inflation(kPa): 410**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

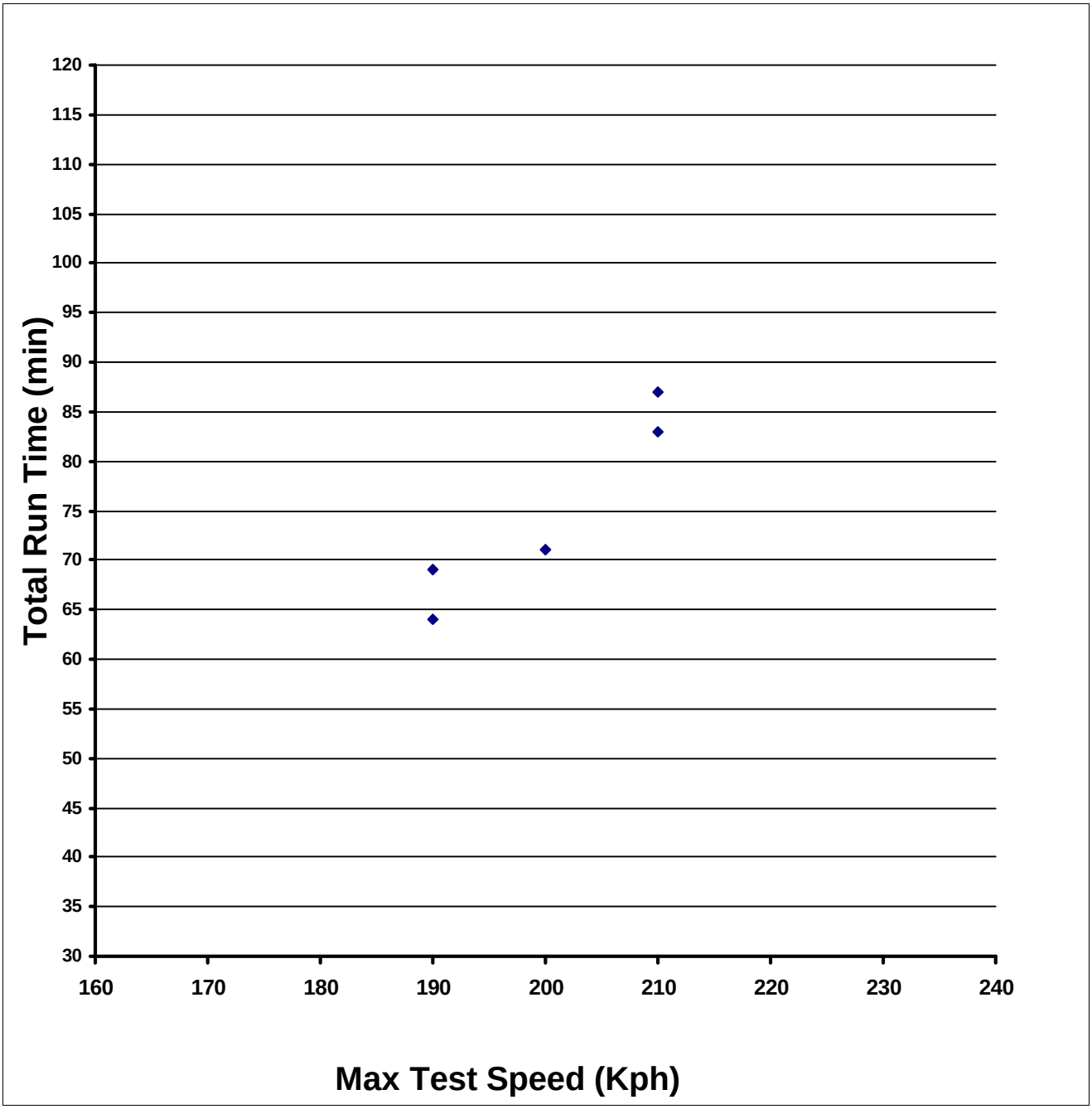
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	230	6	106
	220	9	99
	220	4	94
	220	2	92
	210	5	85
Maximum:	**230**		**106**
Minimum:	**210**		**85**
Average:			**95.2**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-S-90-290-B-RMA

Size: LT235/75R15(C) Speed: S Load (%) 90 Inflation(kPa): 290

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-S-90-290-B-RMA

Size: LT235/75R15(C) **Speed: S** **Load(%) 90** **Inflation(kPa): 290**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

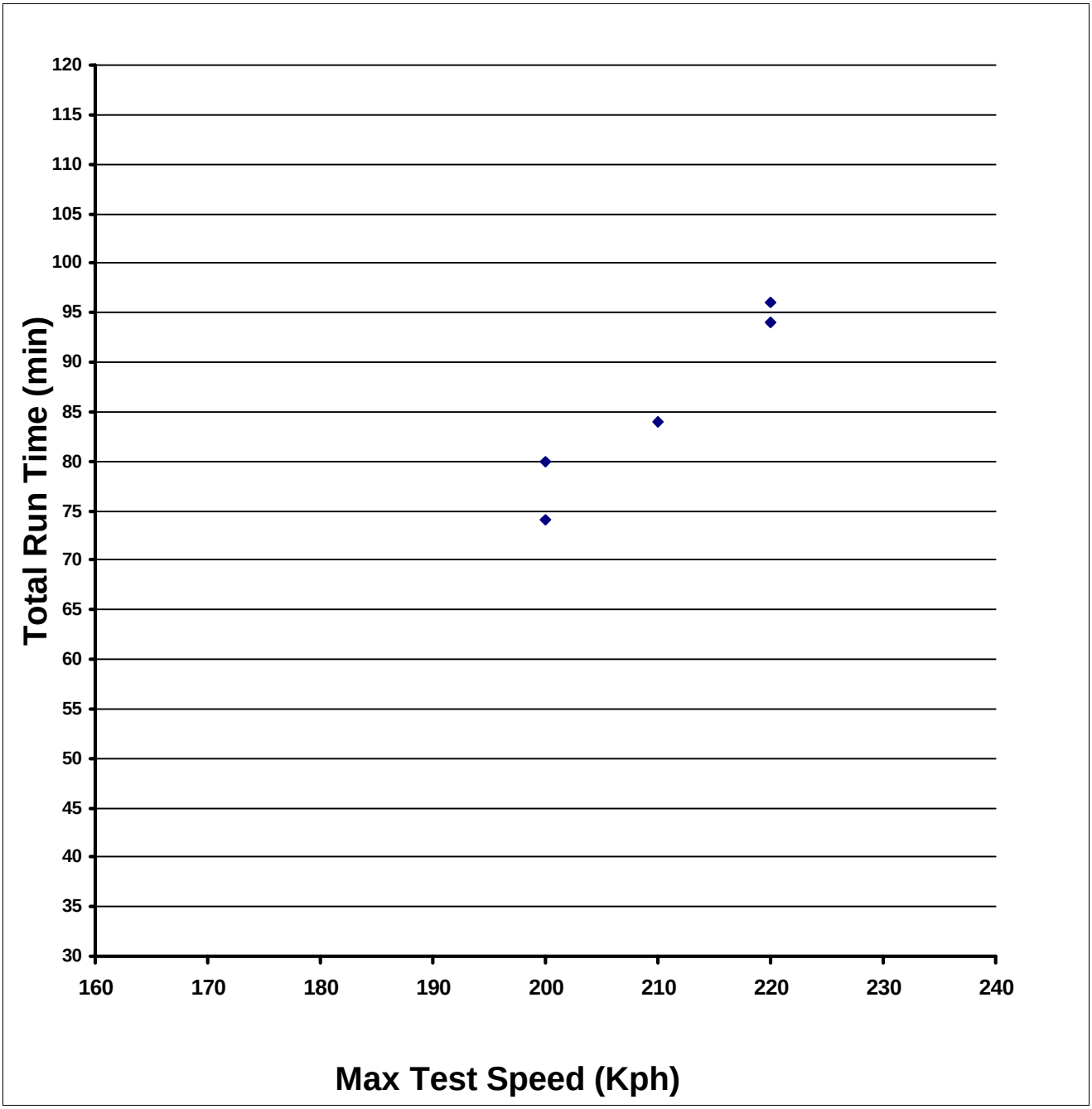
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	7	87
	210	3	83
	200	1	71
	190	9	69
	190	4	64
Maximum:	**210**		**87**
Minimum:	**190**		**64**
Average:			**74.8**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-S-90-350-B-SAE J1633

Size: LT235/75R15(C) Speed: S Load (%) 90 Inflation(kPa): 350

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-S-90-350-B-SAE J1633

Size: LT235/75R15(C) **Speed: S** **Load(%) 90** **Inflation(kPa): 350**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

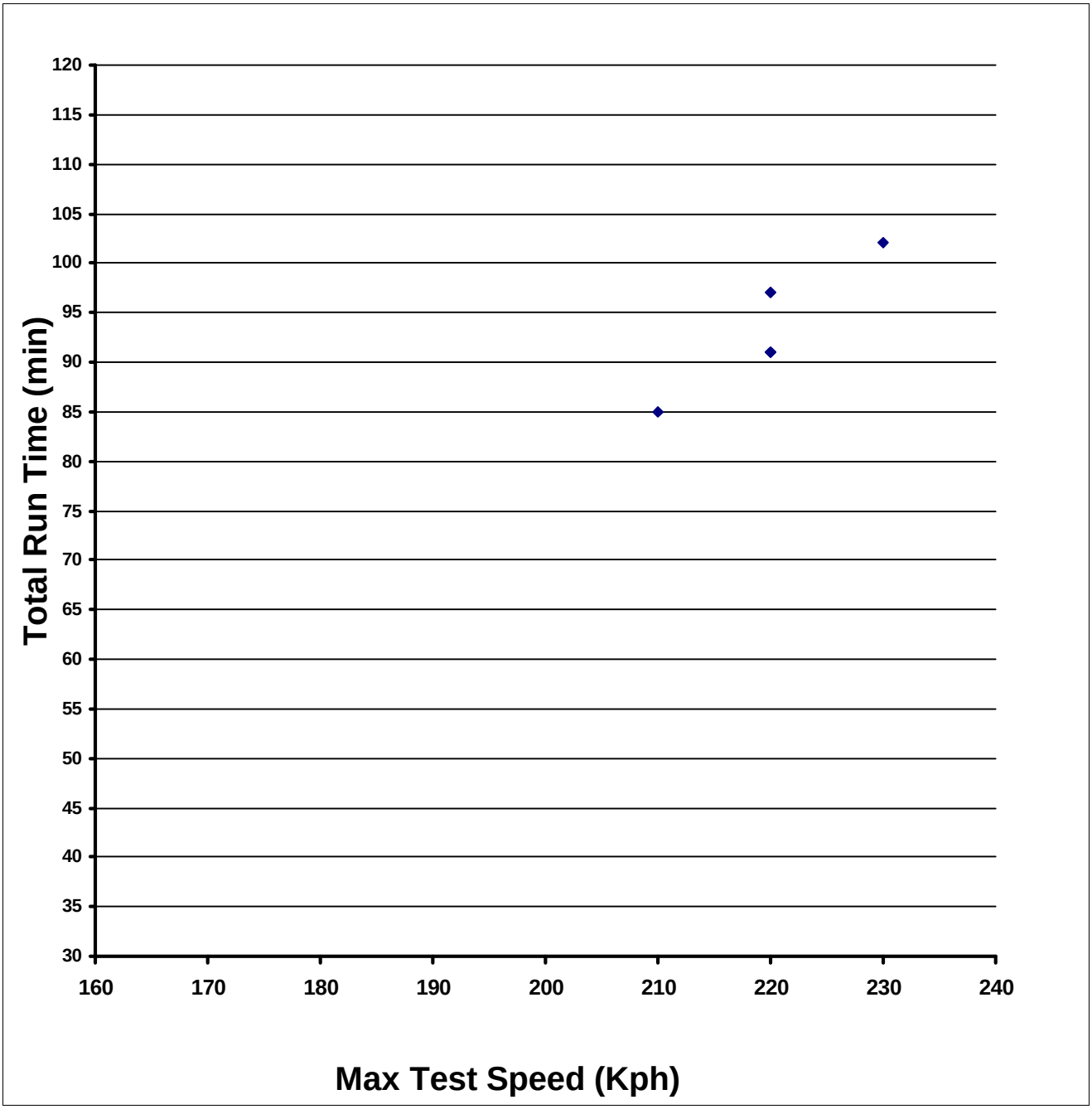
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	6	96
	220	4	94
	210	4	84
	200	10	80
	200	4	74
Maximum:	**220**		**96**
Minimum:	**200**		**74**
Average:			**85.6**

Light Truck High Speed Test Results

Page 1 for Test ID LT235/75R15(C)-S-90-410-B-RMA

Size: LT235/75R15(C) Speed: S Load (%) 90 Inflation(kPa): 410

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT235/75R15(C)-S-90-410-B-RMA

Size: LT235/75R15(C) **Speed: S** **Load(%) 90** **Inflation(kPa): 410**

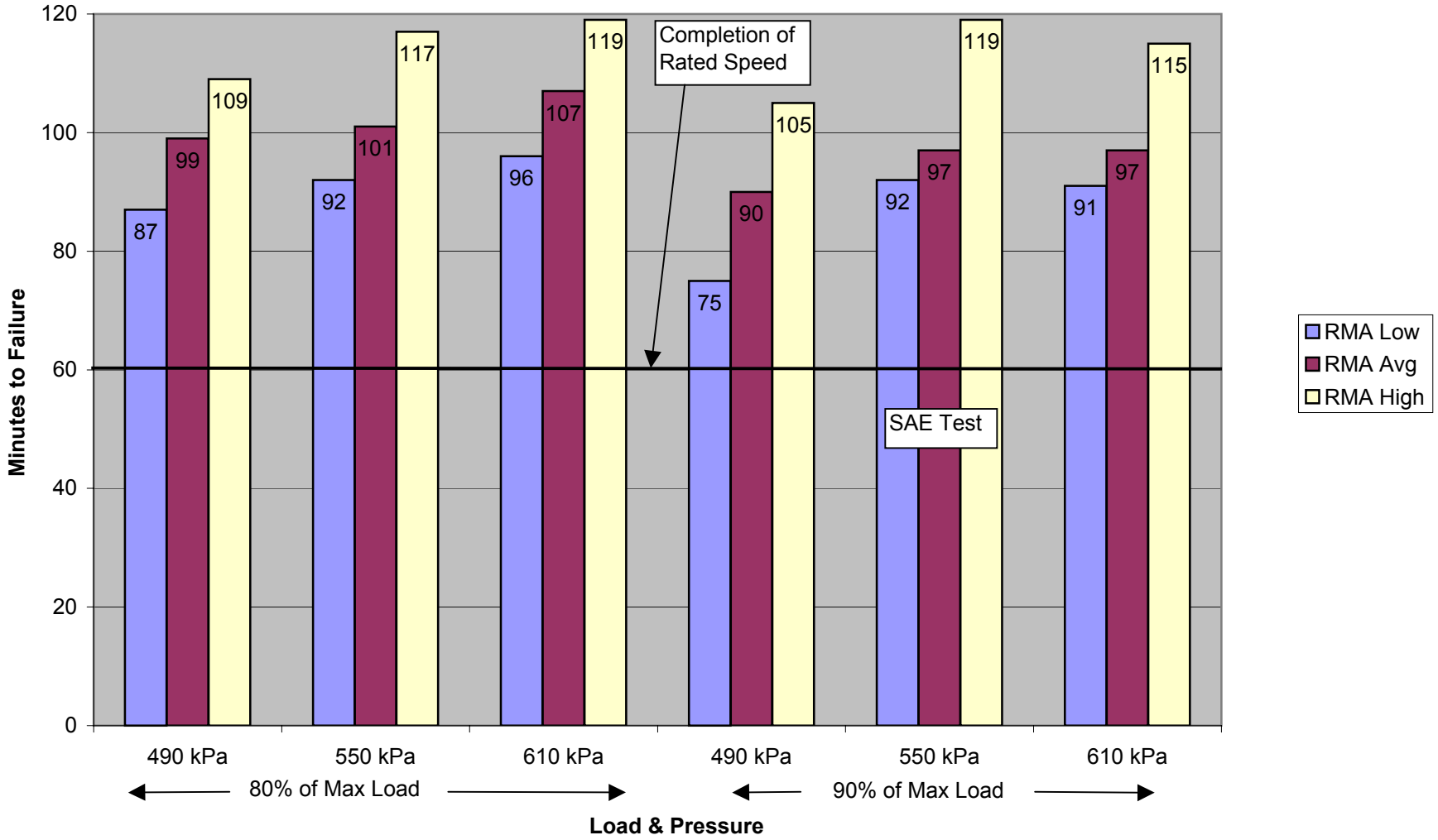
Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	230	2	102
	220	7	97
	220	1	91
	220	1	91
	210	5	85
Maximum:	**230**		**102**
Minimum:	**210**		**85**
Average:			**93.2**

LT245/75R16 (E) Q Speed Rating

Matrix Test

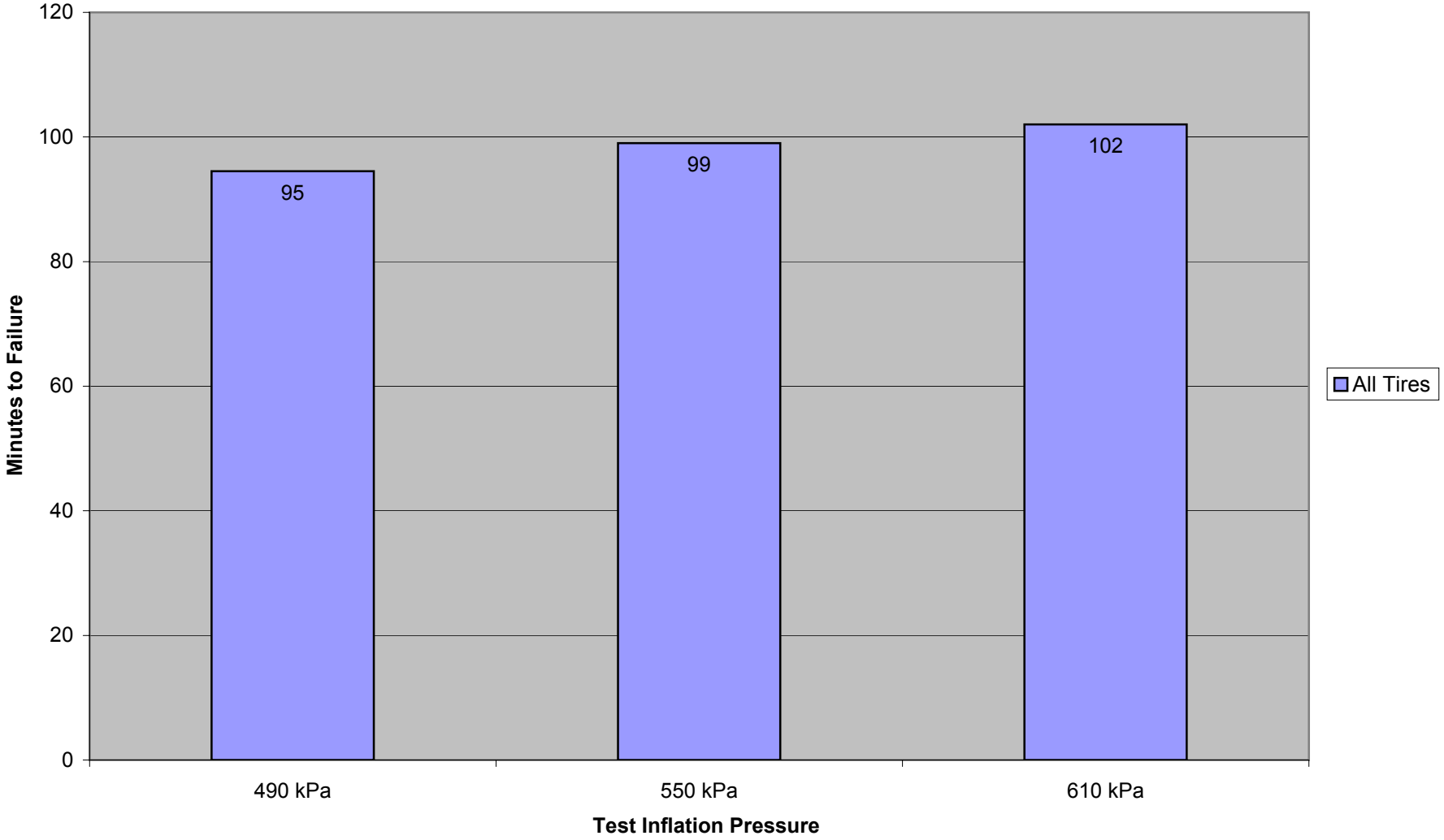
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure



Light Truck High Speed - LT245/75R16 (E) Q - Pressure Effect

Matrix Test

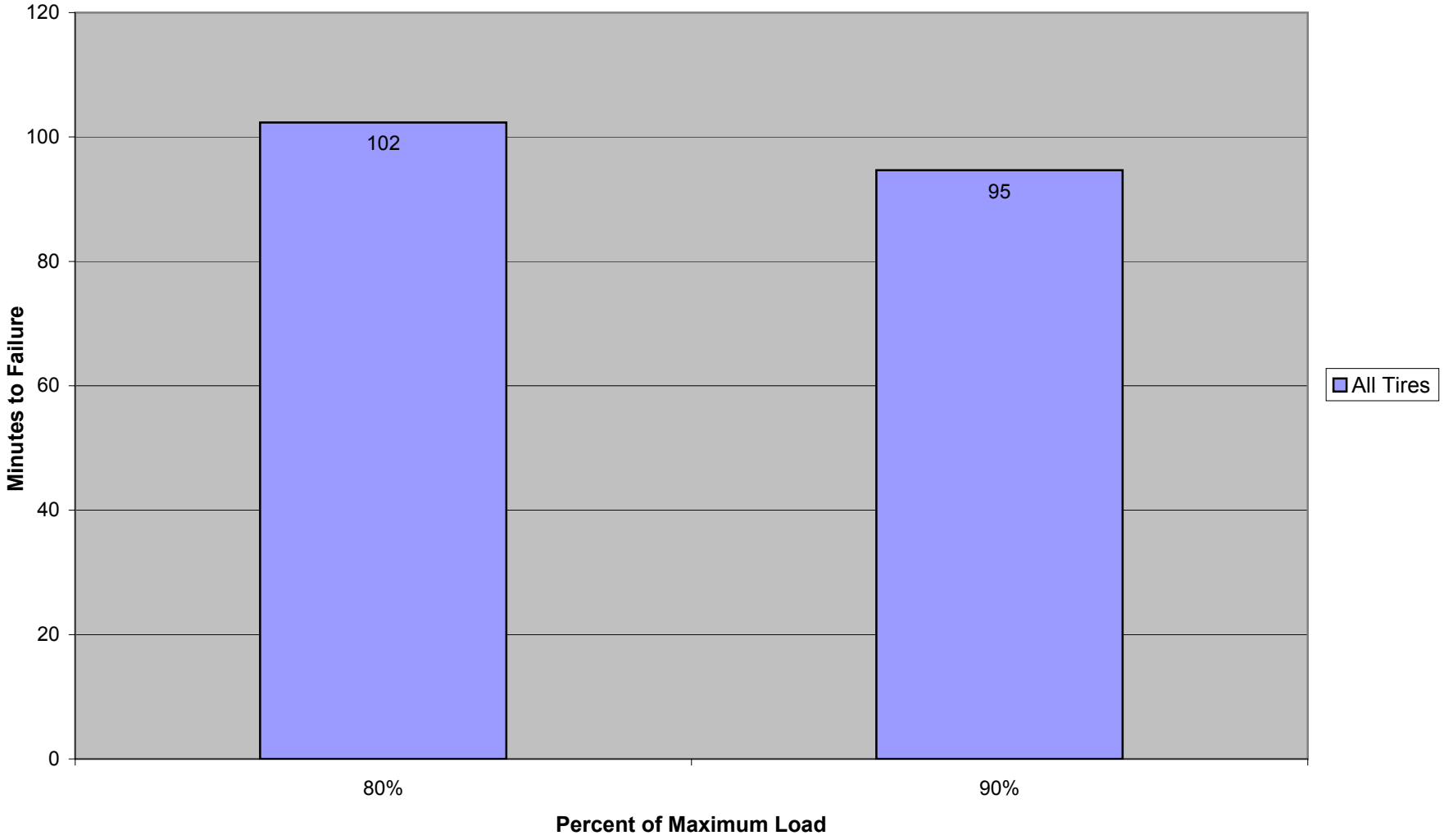
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure



Light Truck High Speed - LT245/75R16 (E) Q Speed Rating - Load Effect

Matrix Test

ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure

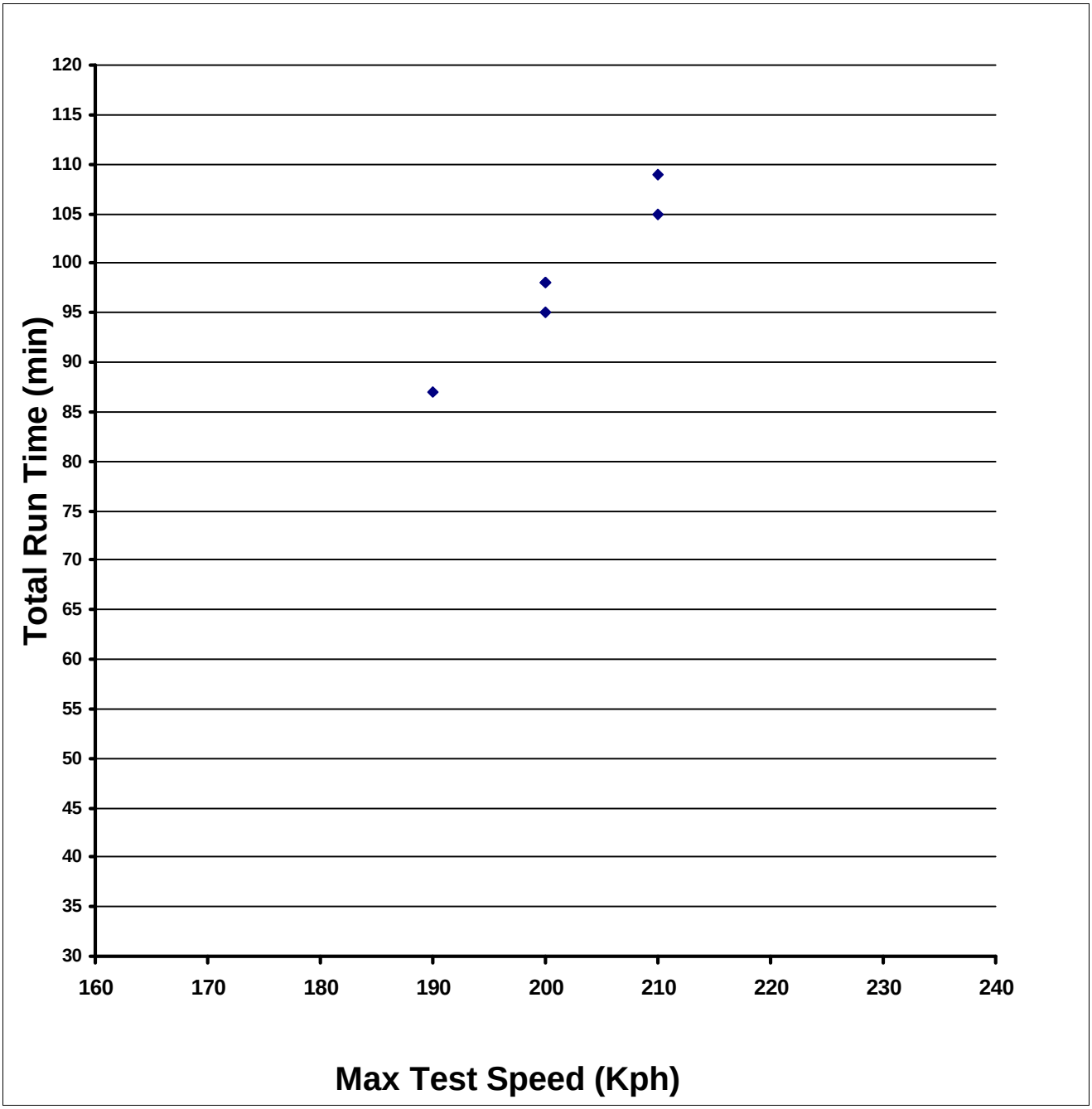


Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-Q-80-490-B-RMA

Size: LT245/75R16(E) Speed: Q Load (%) 80 Inflation(kPa): 490

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-Q-80-490-B-RMA

Size: LT245/75R16(E) **Speed: Q** **Load(%) 80** **Inflation(kPa): 490**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

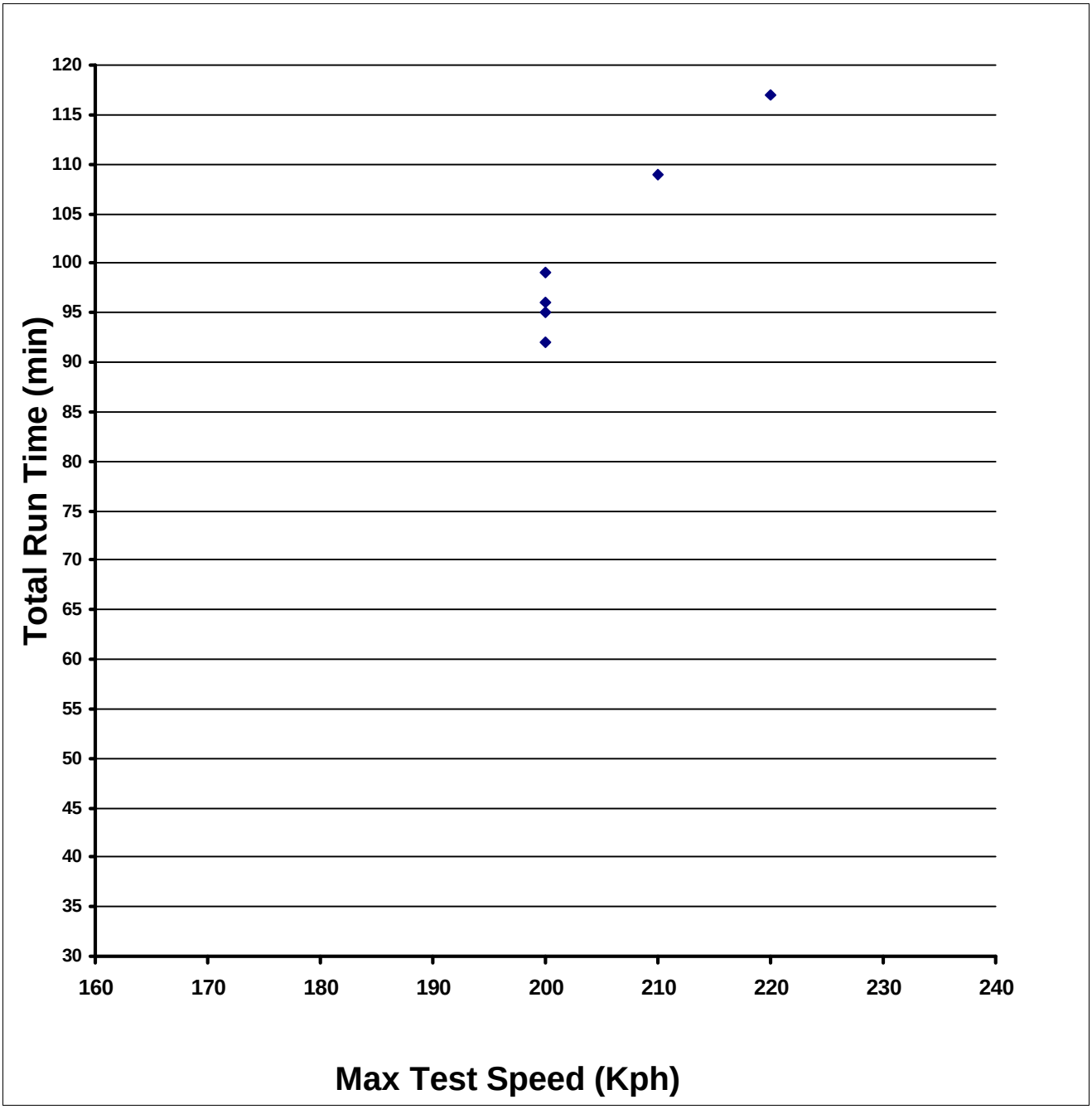
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	9	109
	210	5	105
	200	8	98
	200	8	98
	200	5	95
	190	7	87
Maximum:	**210**		**109**
Minimum:	**190**		**87**
Average:			**98.667**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-Q-80-550-B-RMA

Size: LT245/75R16(E) Speed: Q Load (%) 80 Inflation(kPa): 550

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-Q-80-550-B-RMA

Size: LT245/75R16(E) **Speed: Q** **Load(%) 80** **Inflation(kPa): 550**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

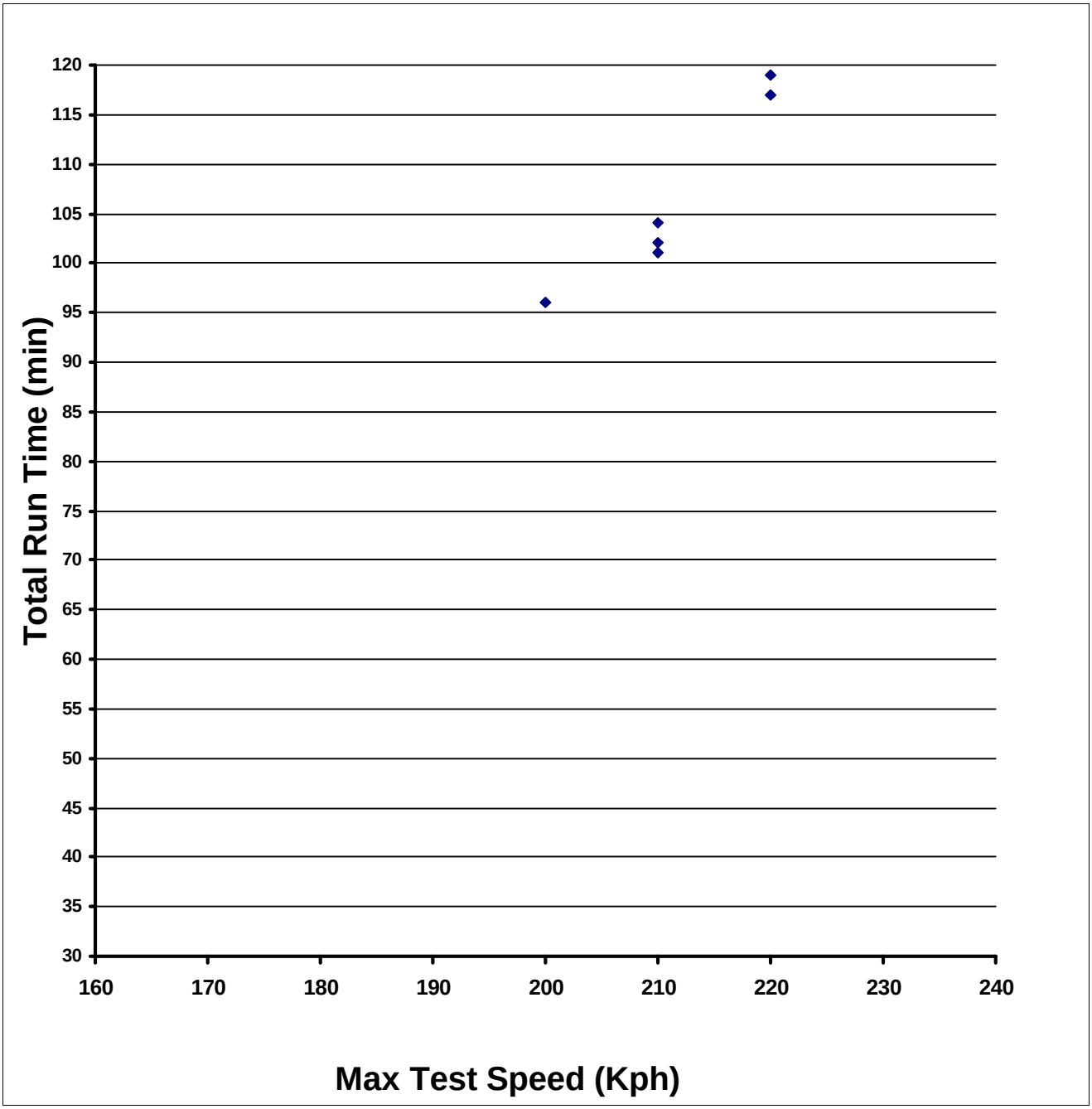
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	7	117
	210	9	109
	200	9	99
	200	6	96
	200	5	95
	200	2	92
Maximum:	**220**		**117**
Minimum:	**200**		**92**
Average:			**101.33**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-Q-80-610-B-RMA

Size: LT245/75R16(E) Speed: Q Load (%) 80 Inflation(kPa): 610

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-Q-80-610-B-RMA

Size: LT245/75R16(E) **Speed: Q** **Load(%) 80** **Inflation(kPa): 610**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

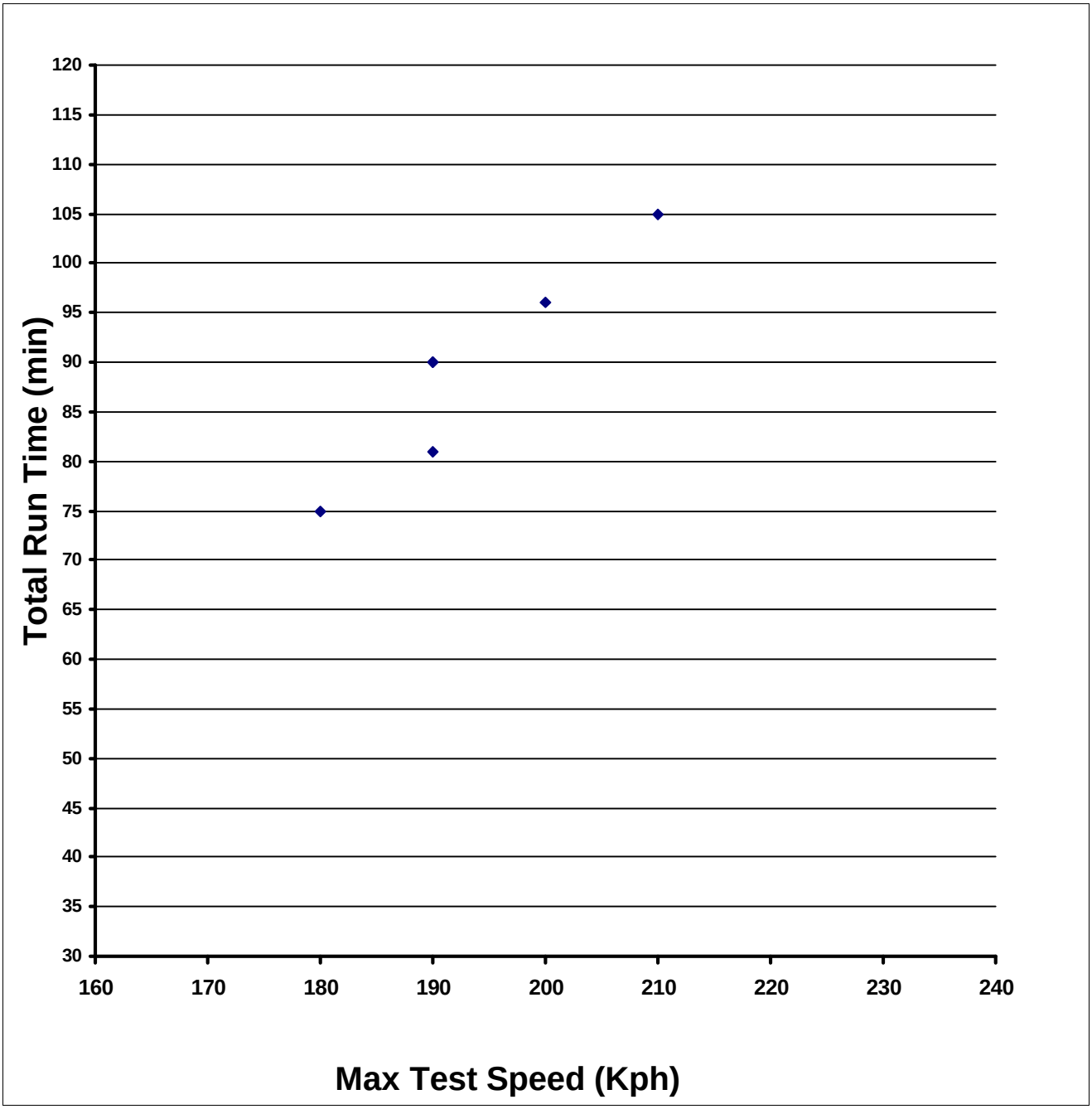
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	9	119
	220	7	117
	210	4	104
	210	2	102
	210	1	101
	200	6	96
Maximum:	**220**		**119**
Minimum:	**200**		**96**
Average:			**106.5**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-Q-90-490-B-RMA

Size: LT245/75R16(E) Speed: Q Load (%) 90 Inflation(kPa): 490

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-Q-90-490-B-RMA

Size: LT245/75R16(E) **Speed: Q** **Load(%) 90** **Inflation(kPa): 490**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

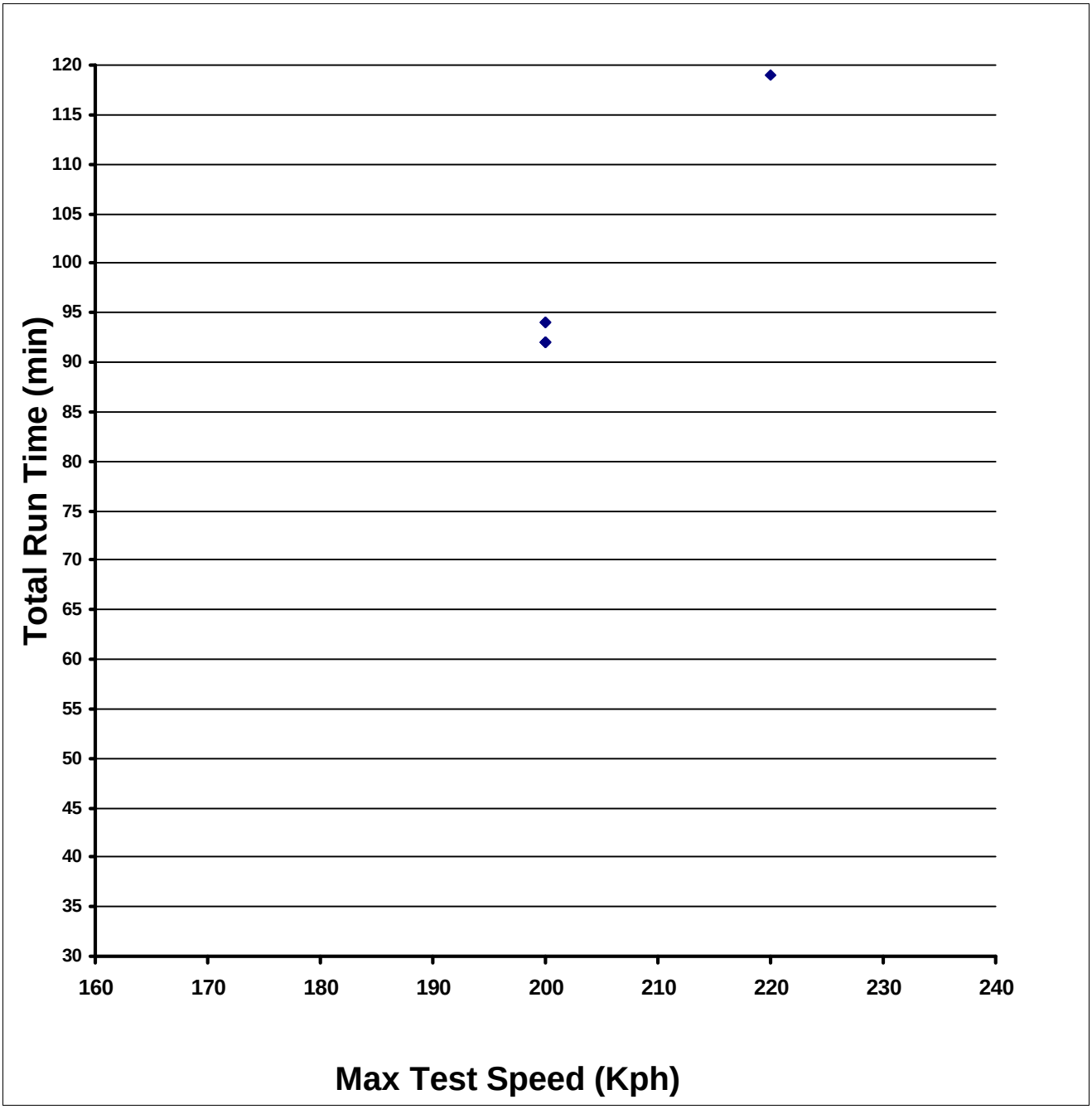
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	5	105
	200	6	96
	190	10	90
	190	10	90
	190	1	81
	180	5	75
Maximum:	**210**		**105**
Minimum:	**180**		**75**
Average:			**89.5**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-Q-90-550-B-SAE J1633

Size: LT245/75R16(E) Speed: Q Load (%) 90 Inflation(kPa): 550

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-Q-90-550-B-SAE J1633

Size: LT245/75R16(E) **Speed: Q** **Load(%) 90** **Inflation(kPa): 550**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

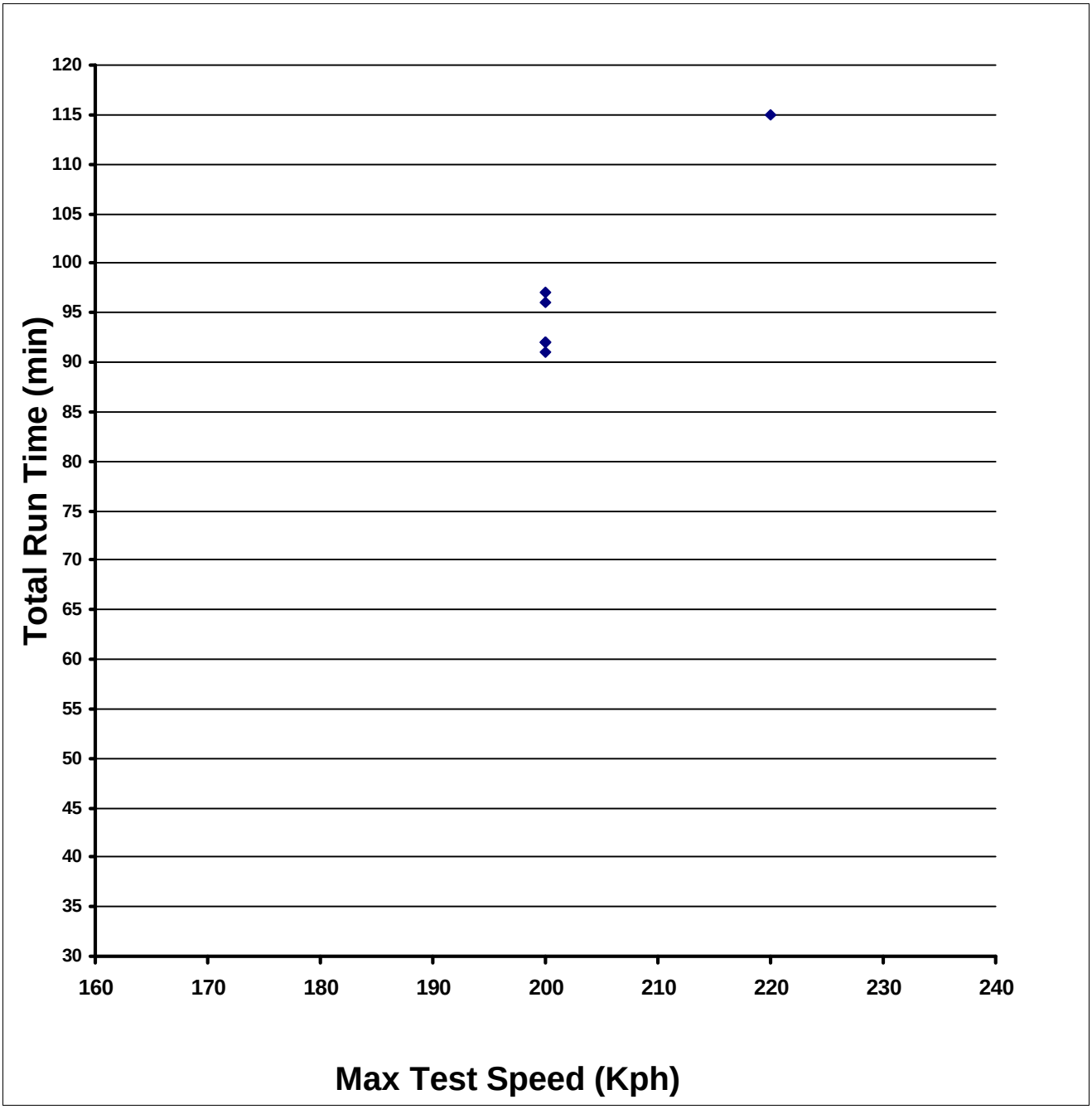
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	9	119
	200	4	94
	200	4	94
	200	2	92
	200	2	92
	200	2	92
Maximum:	**220**		**119**
Minimum:	**200**		**92**
Average:			**97.167**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-Q-90-610-B-RMA

Size: LT245/75R16(E) Speed: Q Load (%) 90 Inflation(kPa): 610

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-Q-90-610-B-RMA

Size: LT245/75R16(E) **Speed: Q** **Load(%) 90** **Inflation(kPa): 610**

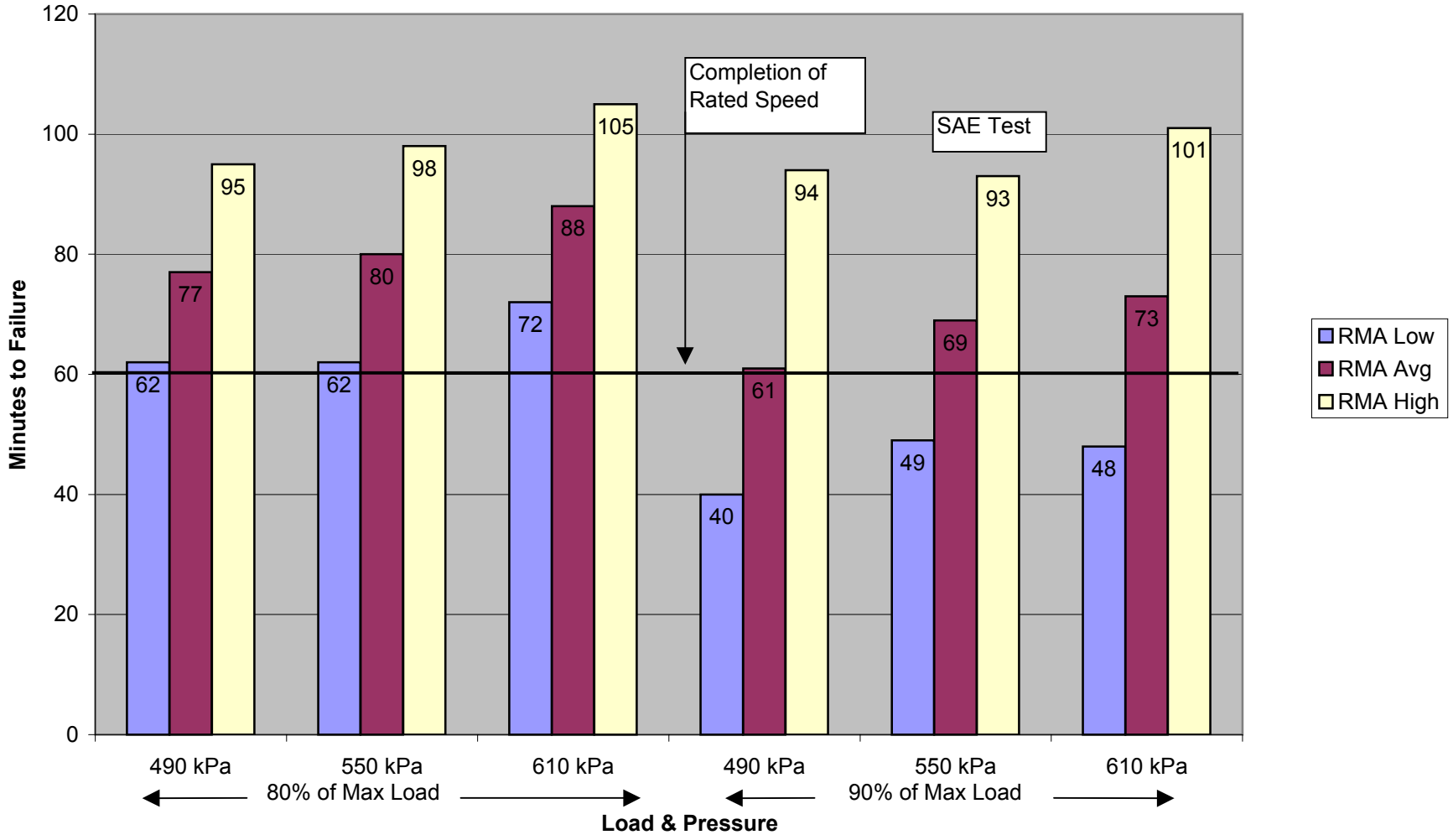
Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	5	115
	200	7	97
	200	6	96
	200	2	92
	200	2	92
	200	1	91
Maximum:	**220**		**115**
Minimum:	**200**		**91**
Average:			**97.167**

LT245/75R16 (E) R Speed Rating

Matrix Test

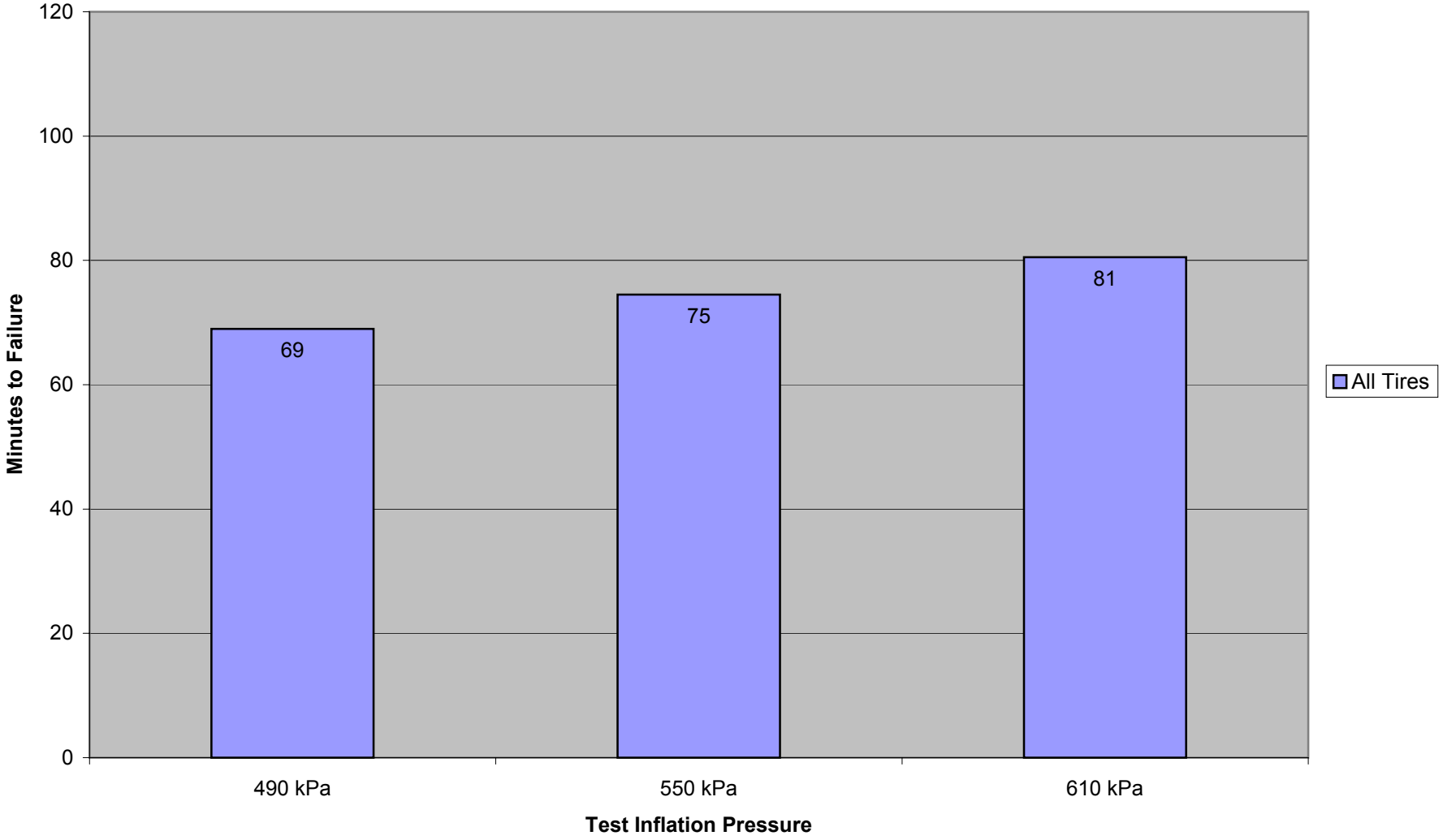
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure



Light Truck High Speed - LT245/75R16 (E) R - Pressure Effect

Matrix Test

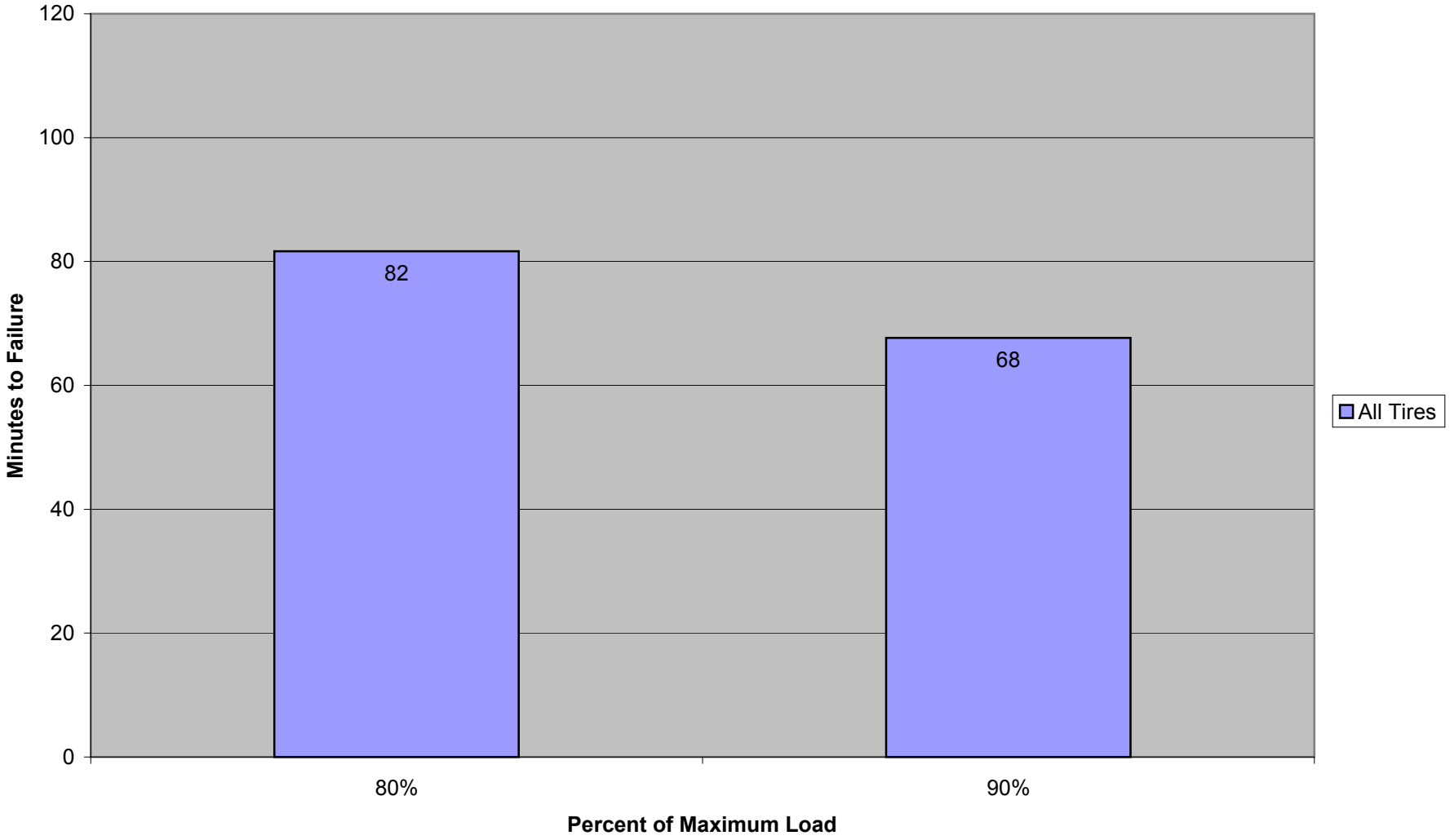
ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure



Light Truck High Speed - LT245/75R16 (E) R Speed Rating - Load Effect

Matrix Test

ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30Min
Then +10kph for 10Min steps to failure

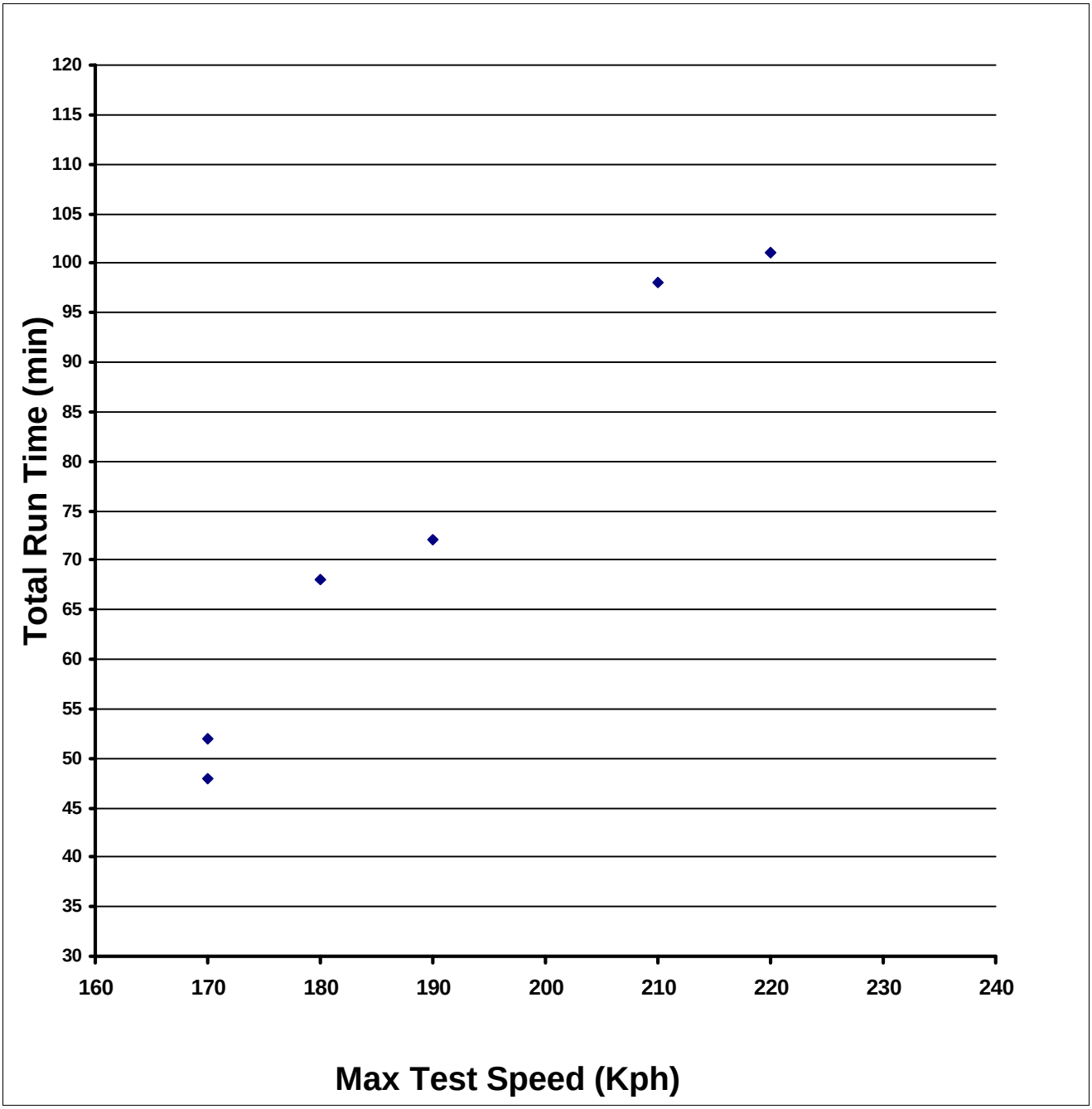


Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-R-90-610-B-RMA

Size: LT245/75R16(E) Speed: R Load (%) 90 Inflation(kPa): 610

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-R-90-610-B-RMA

Size: LT245/75R16(E) **Speed: R** **Load(%) 90** **Inflation(kPa): 610**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

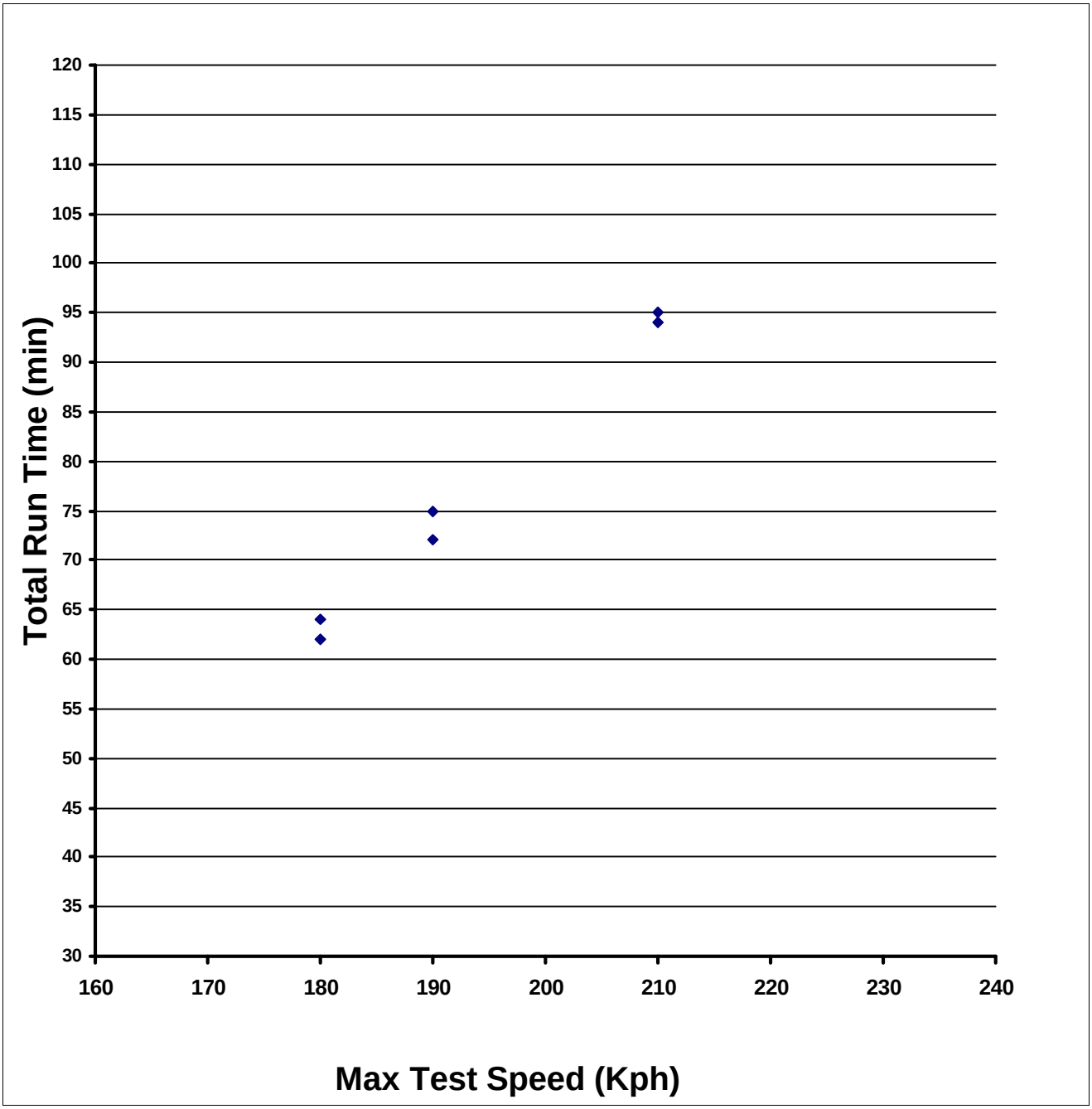
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	1	101
	210	8	98
	190	2	72
	180	8	68
	170	22	52
	170	18	48
Maximum:	**220**		**101**
Minimum:	**170**		**48**
Average:			**73.167**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-R-80-490-B-RMA

Size: LT245/75R16(E) Speed: R Load (%) 80 Inflation(kPa): 490

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-R-80-490-B-RMA

Size: LT245/75R16(E) **Speed: R** **Load(%) 80** **Inflation(kPa): 490**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

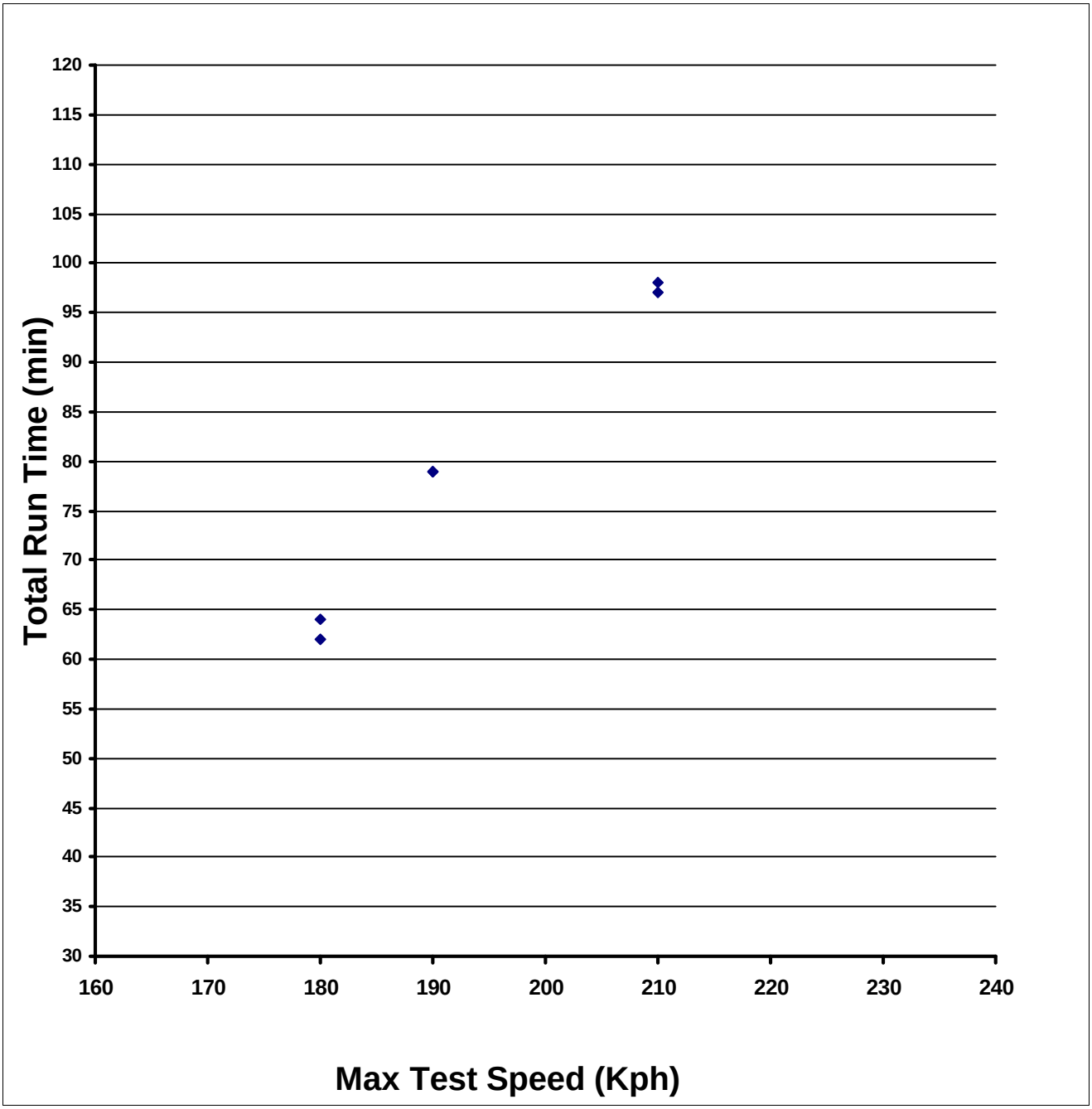
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	5	95
	210	4	94
	190	5	75
	190	2	72
	180	4	64
	180	2	62
Maximum:	**210**		**95**
Minimum:	**180**		**62**
Average:			**77**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-R-80-550-B-RMA

Size: LT245/75R16(E) Speed: R Load (%) 80 Inflation(kPa): 550

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-R-80-550-B-RMA

Size: LT245/75R16(E) **Speed: R** **Load(%) 80** **Inflation(kPa): 550**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

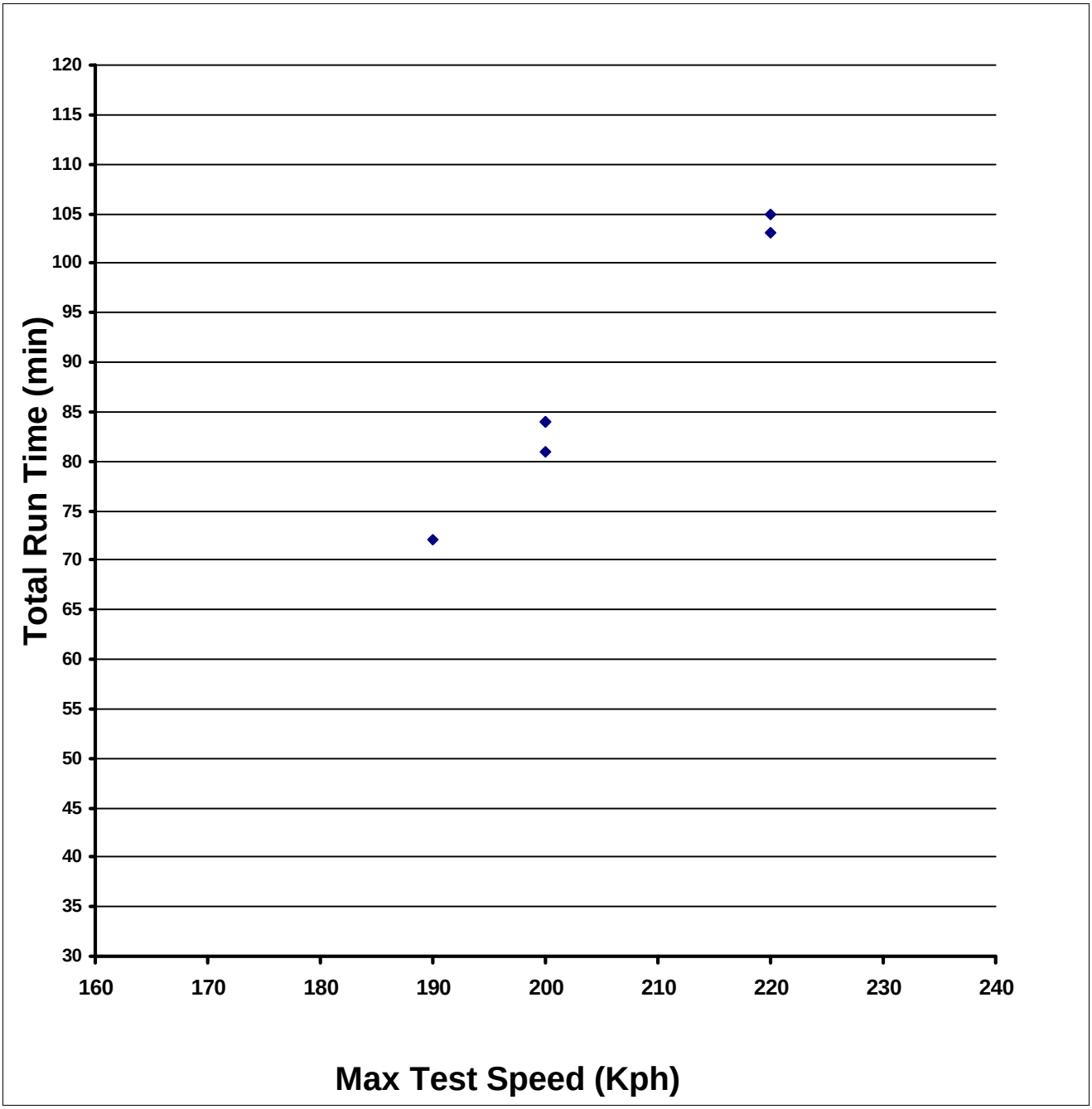
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	8	98
	210	7	97
	190	9	79
	190	9	79
	180	4	64
	180	2	62
Maximum:	**210**		**98**
Minimum:	**180**		**62**
Average:			**79.833**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-R-80-610-B-RMA

Size: LT245/75R16(E) Speed: R Load (%) 80 Inflation(kPa): 610

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-R-80-610-B-RMA

Size: LT245/75R16(E) **Speed: R** **Load(%) 80** **Inflation(kPa): 610**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

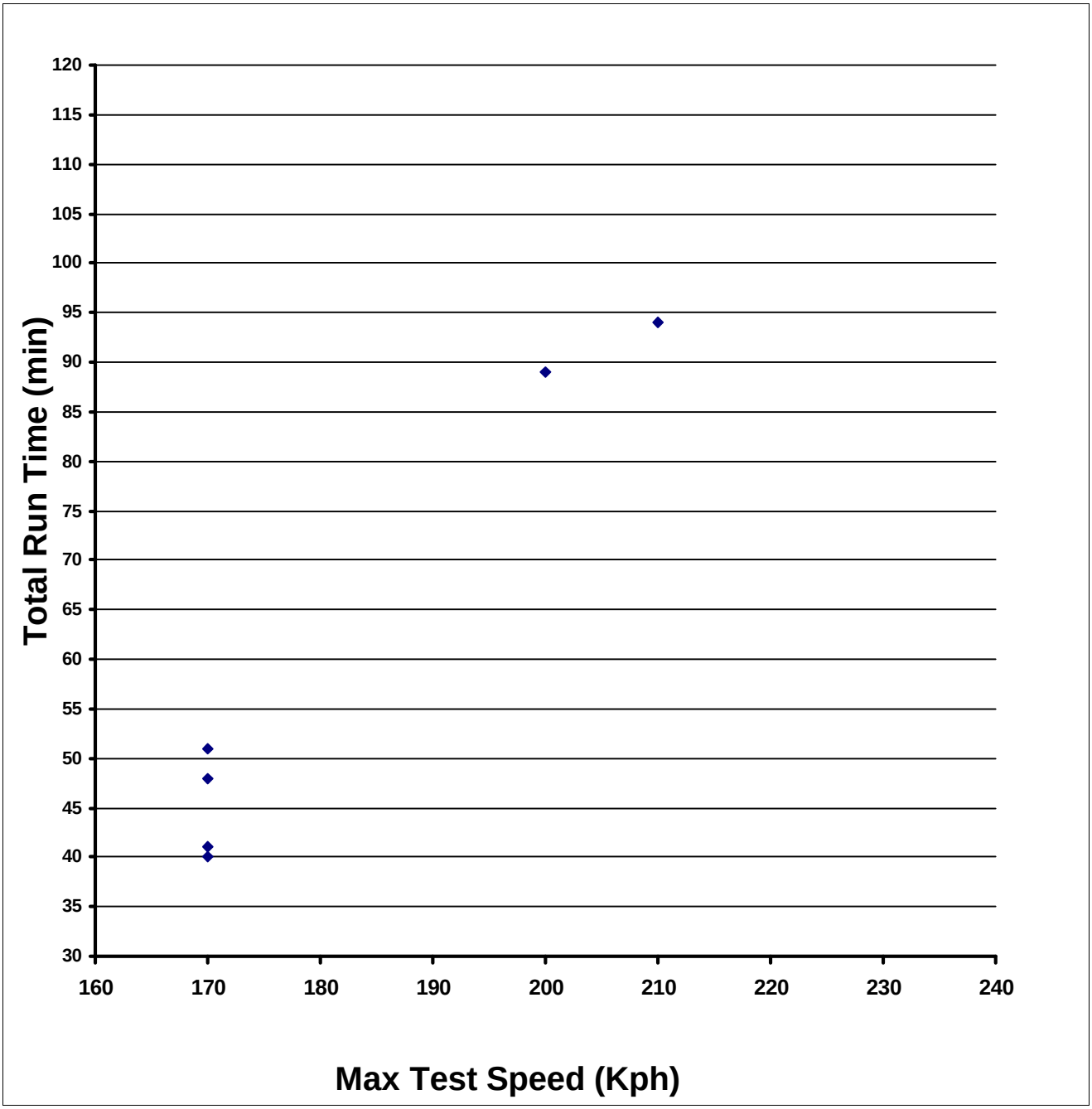
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	220	5	105
	220	3	103
	200	4	84
	200	4	84
	200	1	81
	190	2	72
Maximum:	**220**		**105**
Minimum:	**190**		**72**
Average:			**88.167**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-R-90-490-B-RMA

Size: LT245/75R16(E) Speed: R Load (%) 90 Inflation(kPa): 490

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-R-90-490-B-RMA

Size: LT245/75R16(E) **Speed: R** **Load(%) 90** **Inflation(kPa): 490**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

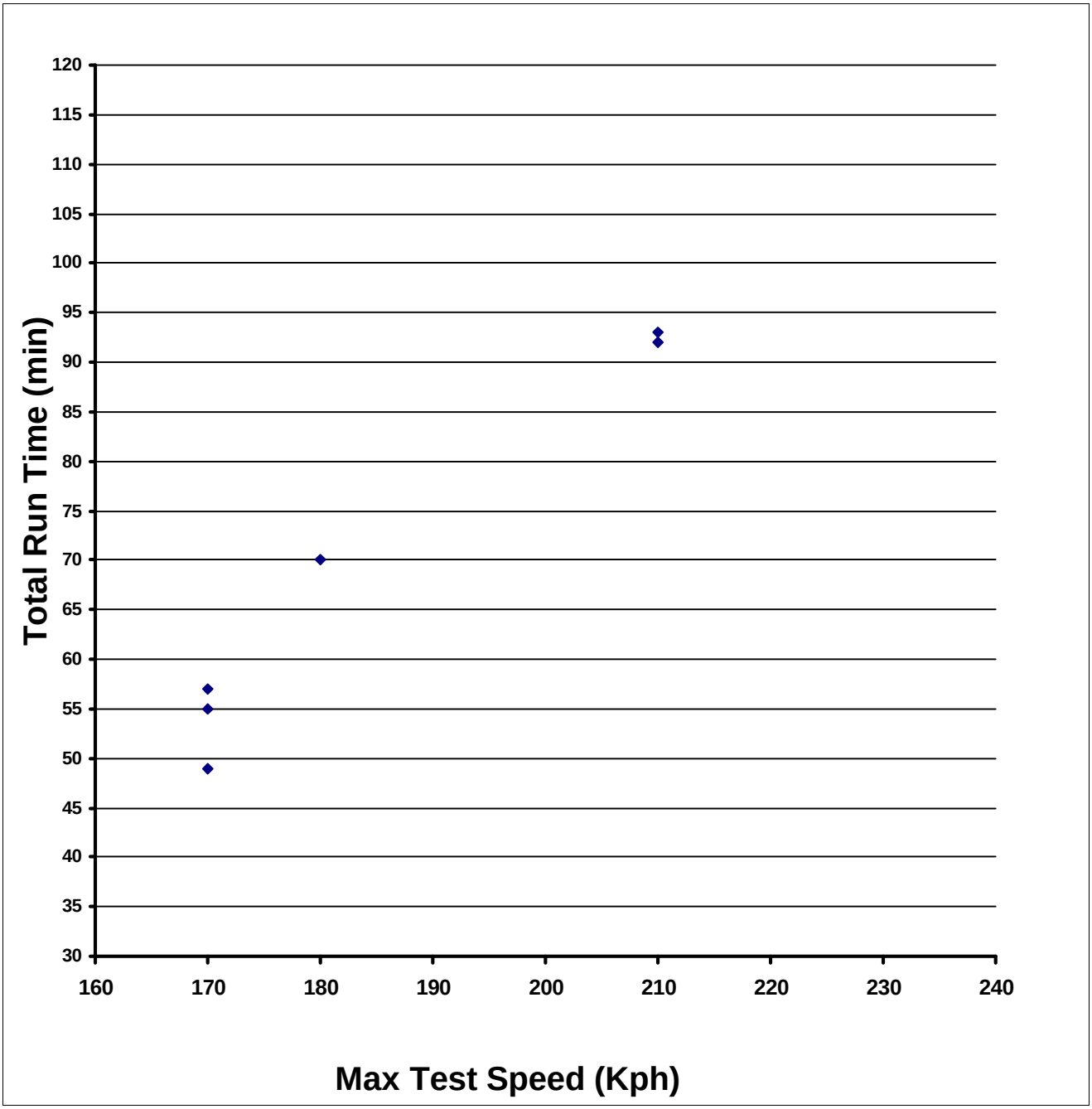
Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	4	94
	200	9	89
	170	21	51
	170	18	48
	170	11	41
	170	10	40
Maximum:	**210**		**94**
Minimum:	**170**		**40**
Average:			**60.5**

Light Truck High Speed Test Results

Page 1 for Test ID LT245/75R16(E)-R-90-550-B-SAE J1633

Size: LT245/75R16(E) Speed: R Load (%) 90 Inflation(kPa): 550

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**



Light Truck High Speed Test Results

Page 2 for Test ID LT245/75R16(E)-R-90-550-B-SAE J1633

Size: LT245/75R16(E) **Speed: R** **Load(%) 90** **Inflation(kPa): 550**

Test Condition: **ITS=RS-20, 0 to ITS, ITS, +10, +20 for 10, 10, 10, 30 min; then +10kph for 10 min steps to failure**

Test Results:	Speed@Failure (kph):	Time@Failure (min)	Total Run Time (min):
	210	3	93
	210	2	92
	180	10	70
	170	27	57
	170	25	55
	170	19	49
Maximum:	**210**		**93**
Minimum:	**170**		**49**
Average:			**69.333**

Light Truck Tire High Speed Test

RMA Recommendation

- **SAE J1633** (Using 1.7 m diameter test wheel; Same as ISO 10454 using max pressure; Application limited to tires marked “LT” or “C”, and tires with Load Range “A” through “E”, or Load Index 124 or below.)
  - **Inflation Pressure**
    - 100% of inflation pressure corresponding to the maximum load
  - **Speed**
    - Initial Test Speed (ITS) = Rated Speed (RS) – 20 km/h
    - 0 to ITS, ITS, +10, +20 km/h
  - **Duration**
    - 0 to ITS = 10 minutes, ITS = 10 minutes, ITS + 10 for 10 minutes, ITS + 20 for 30 minutes
  - **Load**
    - 90% of maximum single tire load
  - **Ambient Temperature**
    - 38° C ± 3° C

Light Truck Tire Endurance

RMA Endurance Test Matrix for Study on Light Truck Tires

The object of this study was to determine the failure point of selected tires under controlled conditions of ambient temperature, load, inflation pressure, speed, and duration. Two popular Light Truck tire sizes were selected for inclusion in this study. They were: LT235/75R15 Load Range C, and LT245/75R16 Load Range E. As a comparative test, manufacturers ran the current FMVSS 119 endurance test without change. If the test tire did not fail by the end of the 119 endurance test, the operator continued the test, using 4-hour duration periods with incremental load increases for each period equaling 15% of the maximum load listed on the sidewall until failure occurred. The hours at percent load for failure were recorded on the report form.

For each tire size and load range tested, two tires were tested (#1 tire and #2 tire) for each and every test conducted, thus helping to eliminate anomalies. Each test tire was mounted on the test rim (test rim width tolerance of ± ½ inch) and inflated to the applicable inflation pressure without further adjustment during the test. The mounted test tires were conditioned at the ambient temperature of the test room (38^{o} C) for at least three hours.

Test conditions for speed, inflation pressure, load, duration, ambient temperature and total time are listed in the test matrix on the following pages. Each tire in the study was tested separately at speeds of 120 kph and 140 kph at inflation pressures that were 1) equal to the TRA rated pressure for the size and load range, and 2) equal to the rated pressure less 60 kPa. For the LT235/75R15 (C) tire the inflation pressures were 290 kPa, and 350 kPa. For the LT245/75R16 (E) tire the inflation pressures were 490 kPa, and 550 kPa. The ambient temperature during the tests was 38^{o}C.

The test regimen required each tire to be tested for 24 hours (divided into three 8-hour blocks) under constant conditions of speed, inflation pressure, and ambient temperature. During the 24-hour period each tire was tested for 8 hours at 100 percent of it's maximum load as listed on the sidewall, 8 hours at 110 percent of maximum load, and 8 hours at 115 percent maximum load.

The test operator was asked to record the failure point of each tire tested in terms of the number of hours run during the 8-hour block at which failure occurred. For instance, in the example matrix shown below, if the number one test tire undergoing the 140 kph speed and 290 kPa inflation pressure test regime failed at 6 hours and 25 minutes into the second 8-hour block, the result recorded in the Failure column of the matrix would read: 6 hrs @ 110. Similarly, if the number two tire running on the same test failed at 1 hour and 10 minutes into the third 8-hour block, the results would be recorded: 1 hr @ 115.

If after 24 total hours (three 8-hour periods) of testing there was no tire failure, the operator continued the test, using 4-hour duration periods with incremental load increases for each period equaling 5% of the maximum load listed on the sidewall, until failure occurred. For example, in the sample matrix shown below, for the number one tire tested at 140 kph and 350 kPa if at the end of the third 8-hour block the tire had not failed, the test would have continued for another 4-hour block with the load increased to 120%. During this last (4-hour) block if the tire failed after 3 hours and 20 minutes, the failure data results would have been recorded as 3 hrs @ 120. Similarly, if the number two tire of the same test had completed the first 4-hour block extenuation without failure then another 4-hour block would have been added to the test along with an additional 5% load increase on the tire. If this tire had failed at 2 hours and 40 minutes into the second 4-hour period, the results would have been recorded as 2 hr @ 125.

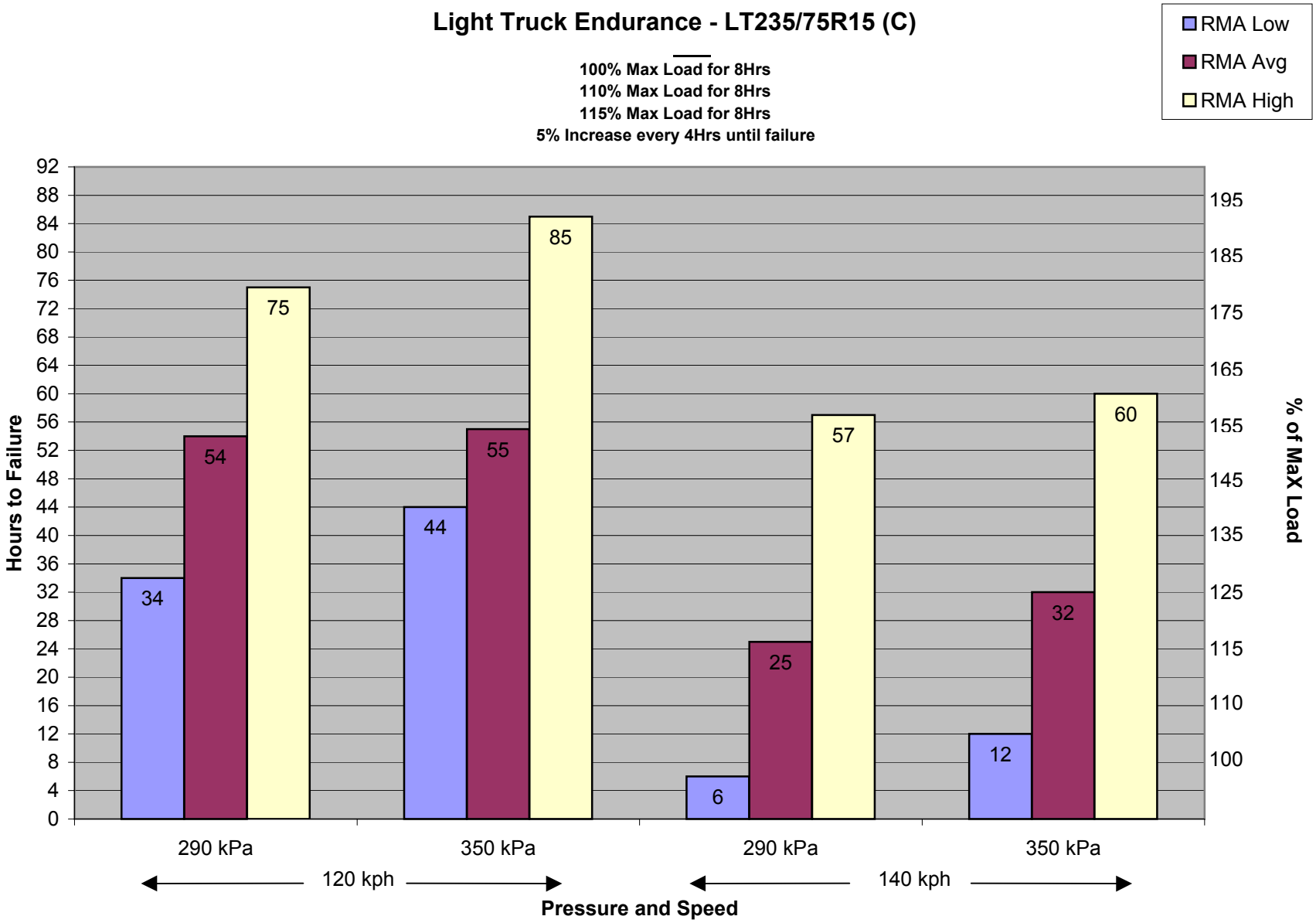
Example of Completed Test Data

TIRE SIZE	**SPEED** (kph)	**INFLATION** (kPa)	**LOAD** (% of maximum listed on sidewall)	**DURATION** (Hours)	**AMBIENT TEMP** (° C)	**TOTAL TIME** (Hours)	**FAILURE** (Hours @ % Load)
LT235/75R15 (C)	140	290	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire *6 @ 110* #2 tire *1 @ 115*
	140	350	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire *3 @ 120* #2 tire *2 @ 125*

On the following pages is the test matrix

TIRE SIZE	SPEED (kph)	INFLATION (kPa)	LOAD (% of maximum listed on sidewall)	DURATION (Hours)	AMBIENT TEMP (°C)	TOTAL TIME (Hours)	FAILURE (Hours @ % Load)
LT235/75R15 (C)	120	290	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
	120	350	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
	140	290	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
	140	350	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
LT245/75R16 (E)	120	490	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
	120	550	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
	140	490	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire
	140	550	100 % maximum load for 8 hours 110 % maximum load for 8 hours 115 % maximum load for 8 hours (+ 5% load increase increments for 4 hours each till failure)	8 8 8	38	24	#1 tire #2 tire

FMVSS 119 Endurance Test		**FAILURE** (Hours @ % Load)
LT235/75R15 (C)	Run as currently written without change [i.e., Inflation Pressure corresponding to the maximum load rating (single) marked on the tire; Temperature = 35°C; Three-step Test Condition: first Step = 75% max load at 80 kph for 7 hours, second step = 97% max load at 80 kph for 16 hours, third step = 114% max load at 80 kph for 24 hours]. If failure doesn't occur before end of specified test duration, continue testing under same conditions of speed, inflation pressure, and ambient temperature, but add 15% load increase increments for 4 hours each till failure.	#1 tire
		#2 tire
LT245/75R16 (E)	Run as currently written without change [i.e., Inflation Pressure corresponding to the maximum load rating (single) marked on the tire; Temperature = 35°C; Three-step Test Condition: first step = 70% max load at 65 kph for 7 hours, second step = 88% max load at 65 kph for 16 hours, third step = 106% max load at 65 kph for 24 hours]. . If failure doesn't occur before end of specified test duration, continue testing under same conditions of speed, inflation pressure, and ambient temperature, but add 15% load increase increments for 4 hours each till failure.	#1 tire
		#2 tire

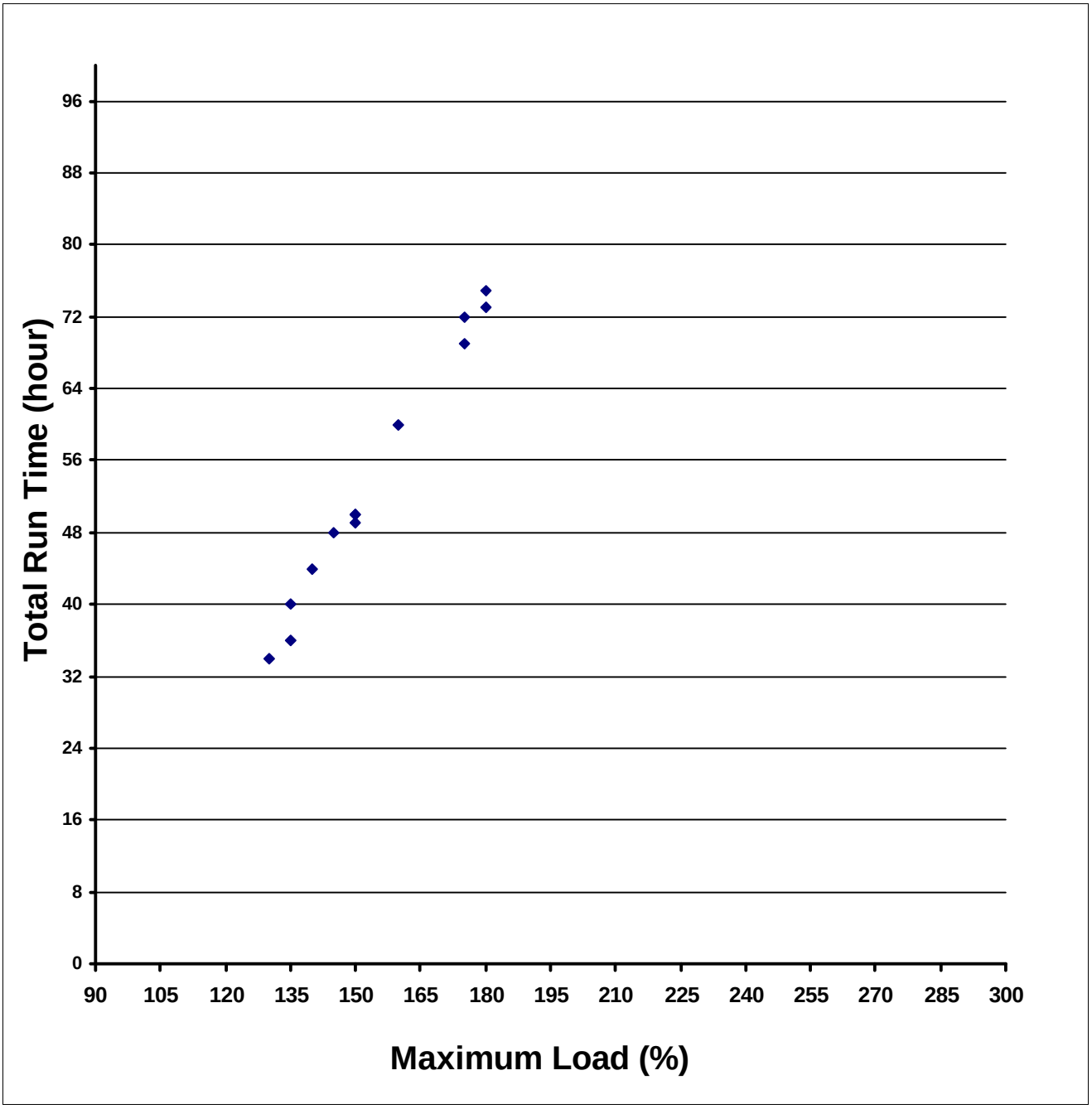

Light Truck Endurance - LT235/75R15 (C)
100% Max Load for 8Hrs
110% Max Load for 8Hrs
115% Max Load for 8Hrs
5% Increase every 4Hrs until failure
RMA Low
RMA Avg
RMA High
Hours to Failure
% of MaX Load
92
88
84
80
76
72
68
64
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
195
185
175
165
155
145
135
125
115
110
100
34
54
75
44
55
85
6
25
57
12
32
60
290 kPa
350 kPa
290 kPa
350 kPa
120 kph
140 kph
Pressure and Speed

Light Truck Endurance Test Results

Page 1 for Test ID LT235/75R15(C)-120-290-RMA

Size: LT235/75R15(C) **Test Speed(kph): 120** **Inflation(kPa): 290**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Light Truck Endurance Test Results

Page 2 for Test ID LT235/75R15(C)-120-290-RMA

Size: LT235/75R15(C) **Test Speed (kph): 120** **Inflation(kPa): 290**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

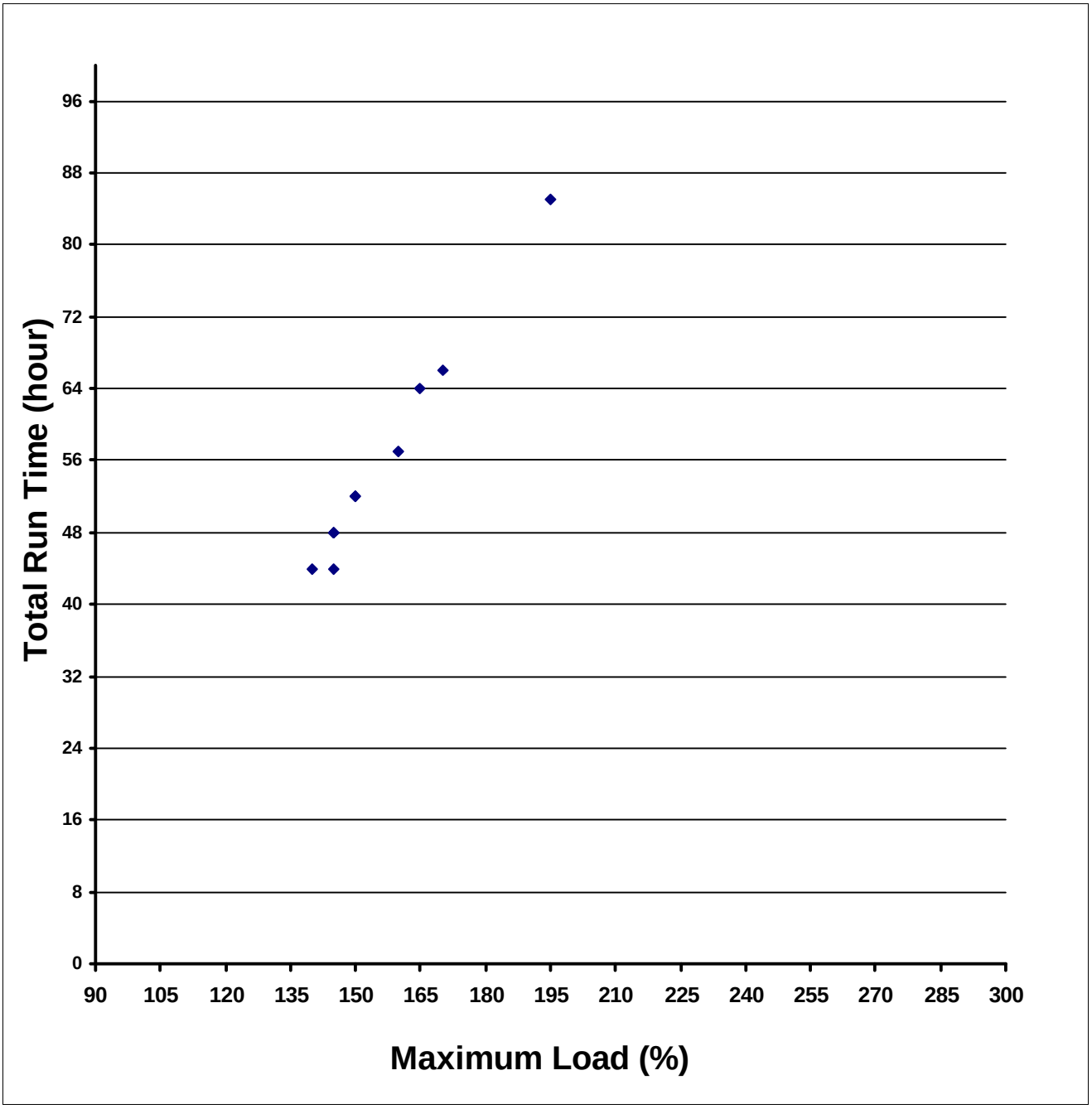
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	180	3	75
	180	1	73
	175	4	72
	175	1	69
	160	4	60
	150	2	50
	150	2	50
	150	1	49
	145	4	48
	140	4	44
	135	4	40
	135	0	36
	130	2	34
Maximum:	**180**		**75**
Minimum:	**130**		**34**
Average:			**53.846**

Light Truck Endurance Test Results

Page 1 for Test ID LT235/75R15(C)-120-350-RMA

Size: LT235/75R15(C) **Test Speed(kph): 120** **Inflation(kPa): 350**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Light Truck Endurance Test Results

Page 2 for Test ID LT235/75R15(C)-120-350-RMA

Size: LT235/75R15(C) **Test Speed (kph): 120** **Inflation(kPa): 350**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

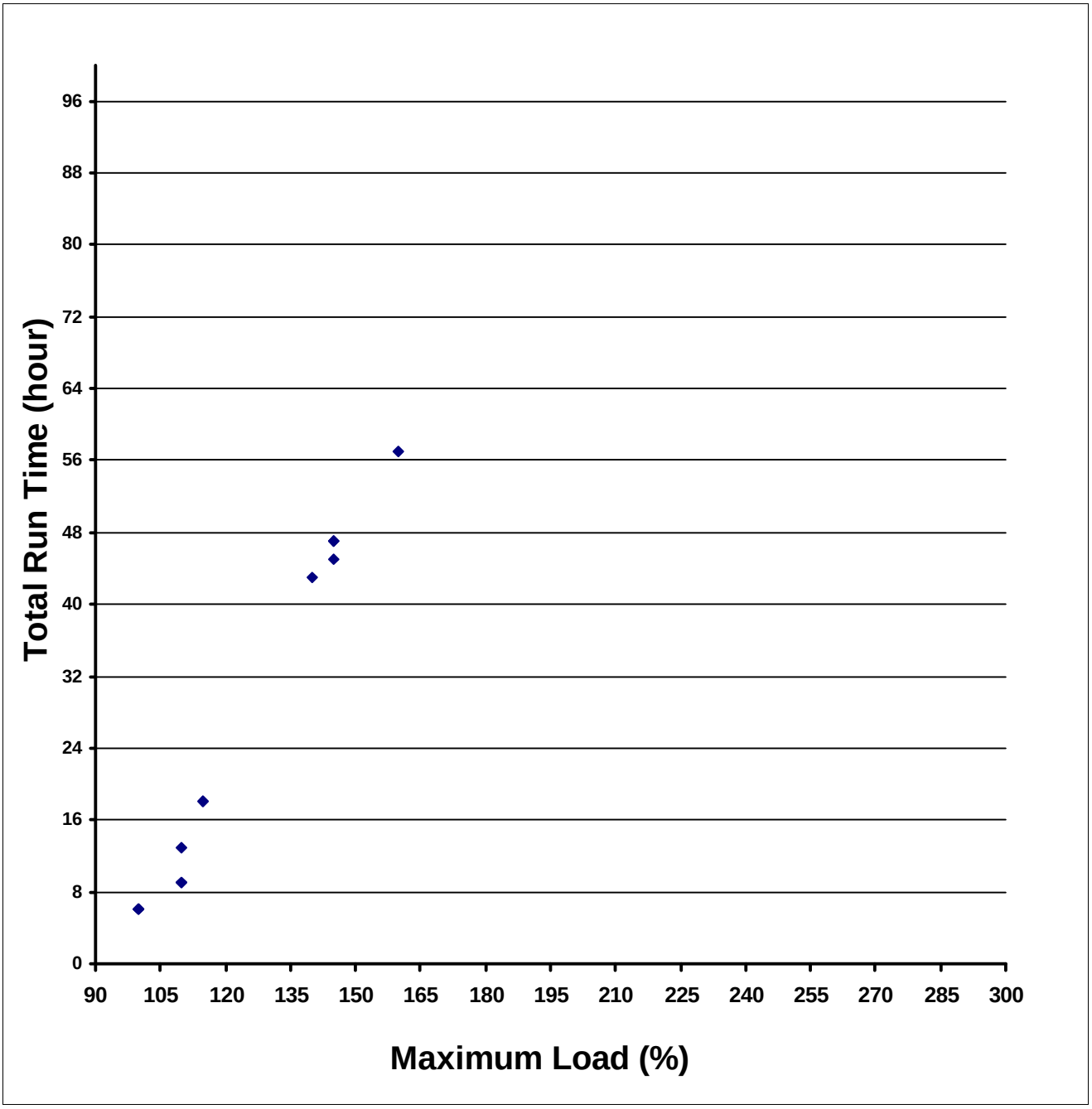
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	195	1	85
	170	2	66
	165	4	64
	160	1	57
	150	4	52
	150	4	52
	145	4	48
	145	4	48
	145	4	48
	140	4	44
	145	0	44
Maximum:	**195**		**85**
Minimum:	**140**		**44**
Average:			**55.273**

Light Truck Endurance Test Results

Page 1 for Test ID LT235/75R15(C)-140-290-RMA

Size: LT235/75R15(C) **Test Speed(kph): 140** **Inflation(kPa): 290**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Light Truck Endurance Test Results

Page 2 for Test ID LT235/75R15(C)-140-290-RMA

Size: LT235/75R15(C) **Test Speed (kph): 140** **Inflation(kPa): 290**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

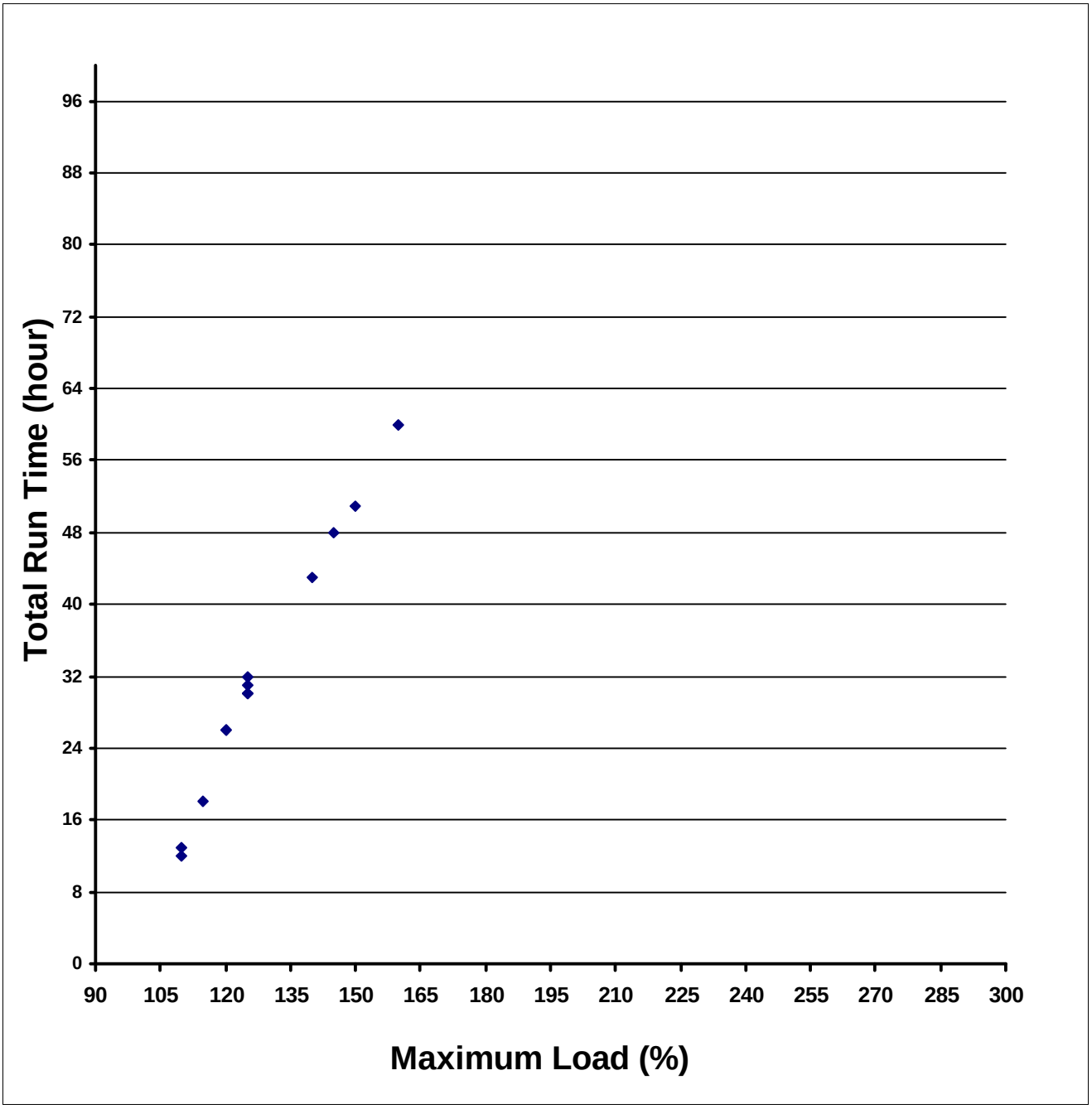
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	160	1	57
	145	3	47
	145	3	47
	145	1	45
	140	3	43
	115	2	18
	115	2	18
	110	5	13
	110	1	9
	110	1	9
	100	6	6
	100	6	6
	100	6	6
Maximum:	**160**		**57**
Minimum:	**100**		**6**
Average:			**24.923**

Light Truck Endurance Test Results

Page 1 for Test ID LT235/75R15(C)-140-350-RMA

Size: LT235/75R15(C) **Test Speed(kph): 140** **Inflation(kPa): 350**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Light Truck Endurance Test Results

Page 2 for Test ID LT235/75R15(C)-140-350-RMA

Size: LT235/75R15(C) **Test Speed (kph): 140** **Inflation(kPa): 350**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

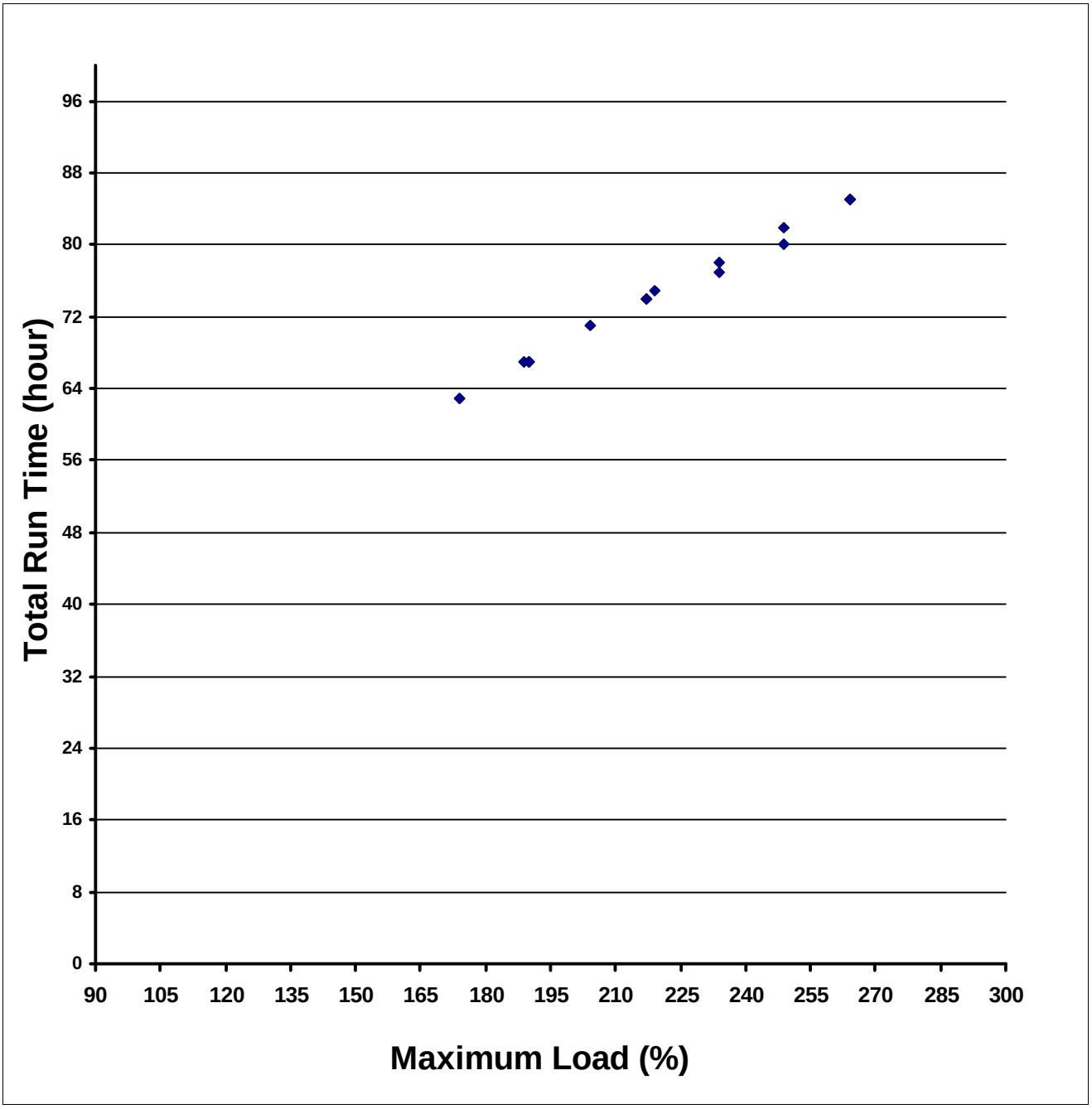
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	160	4	60
	150	3	51
	145	4	48
	140	3	43
	125	4	32
	125	3	31
	125	2	30
	125	2	30
	120	2	26
	120	2	26
	115	2	18
	110	5	13
	110	4	12
Maximum:	**160**		**60**
Minimum:	**110**		**12**
Average:			**32.308**

Light Truck Endurance Test Results

Page 1 for Test ID LT235/75R15(C)-80-350-FMVSS119(A)

Size: LT235/75R15(C) **Test Speed(kph): 80** **Inflation(kPa): 350**

Test Condition: **Load=75% for 7hrs, 97% for 16hrs, 114% for 24hrs, then +15% for 4 hour steps to failure**



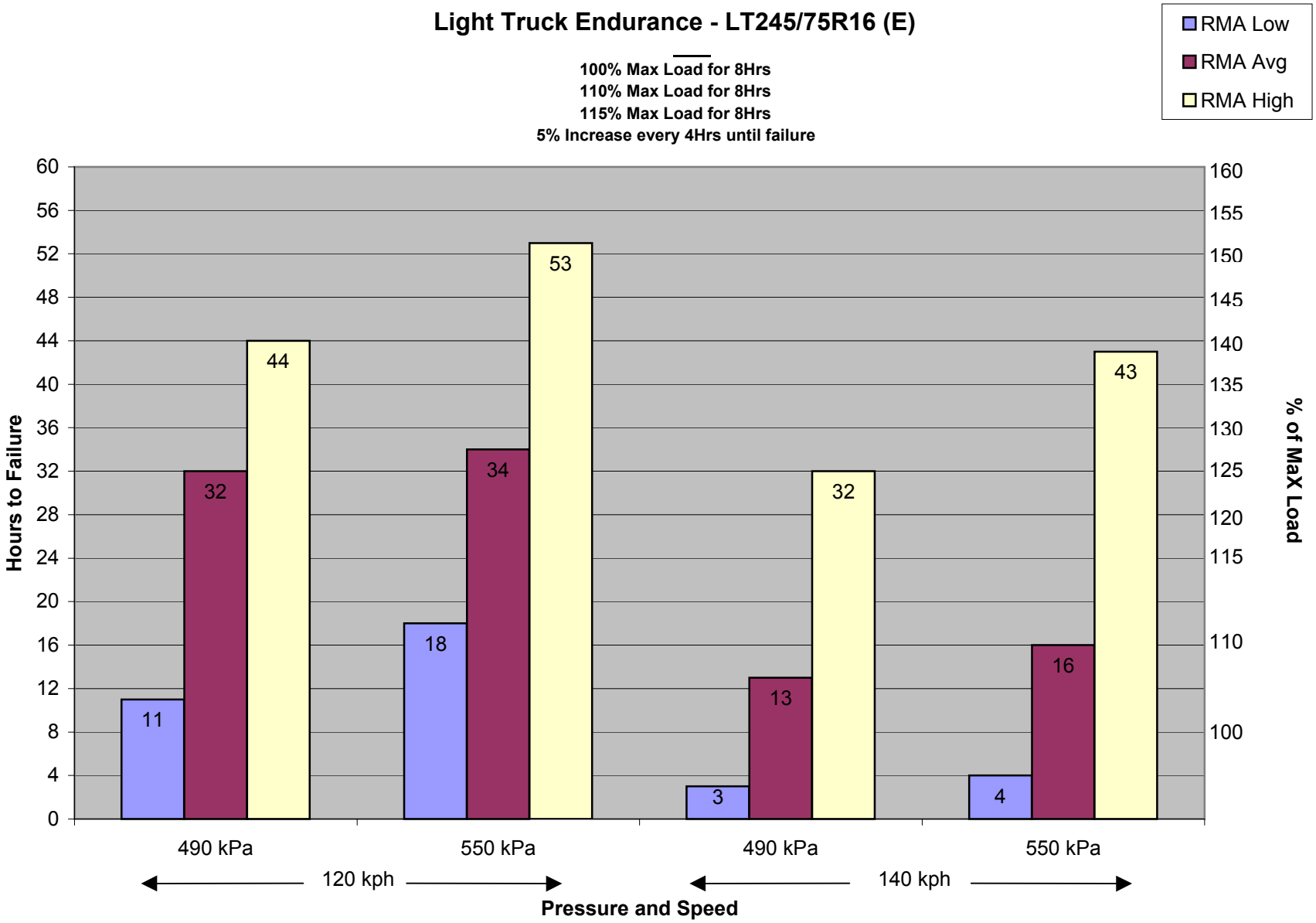
Light Truck Endurance Test Results

Page 2 for Test ID LT235/75R15(C)-80-350-FMVSS119(A)

Size: LT235/75R15(C) **Test Speed (kph): 80** **Inflation(kPa): 350**

Test Condition: **Load=75% for 7hrs, 97% for 16hrs, 114% for 24hrs, then +15% for 4 hour steps to failure**

Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	264	2	85
	264	2	85
	249	3	82
	249	1	80
	234	3	78
	234	2	77
	219	4	75
	217	4	74
	217	4	74
	204	4	71
	190	4	67
	190	4	67
	189	4	67
	174	4	63
Maximum:	**264**		**85**
Minimum:	**174**		**63**
Average:			**74.643**

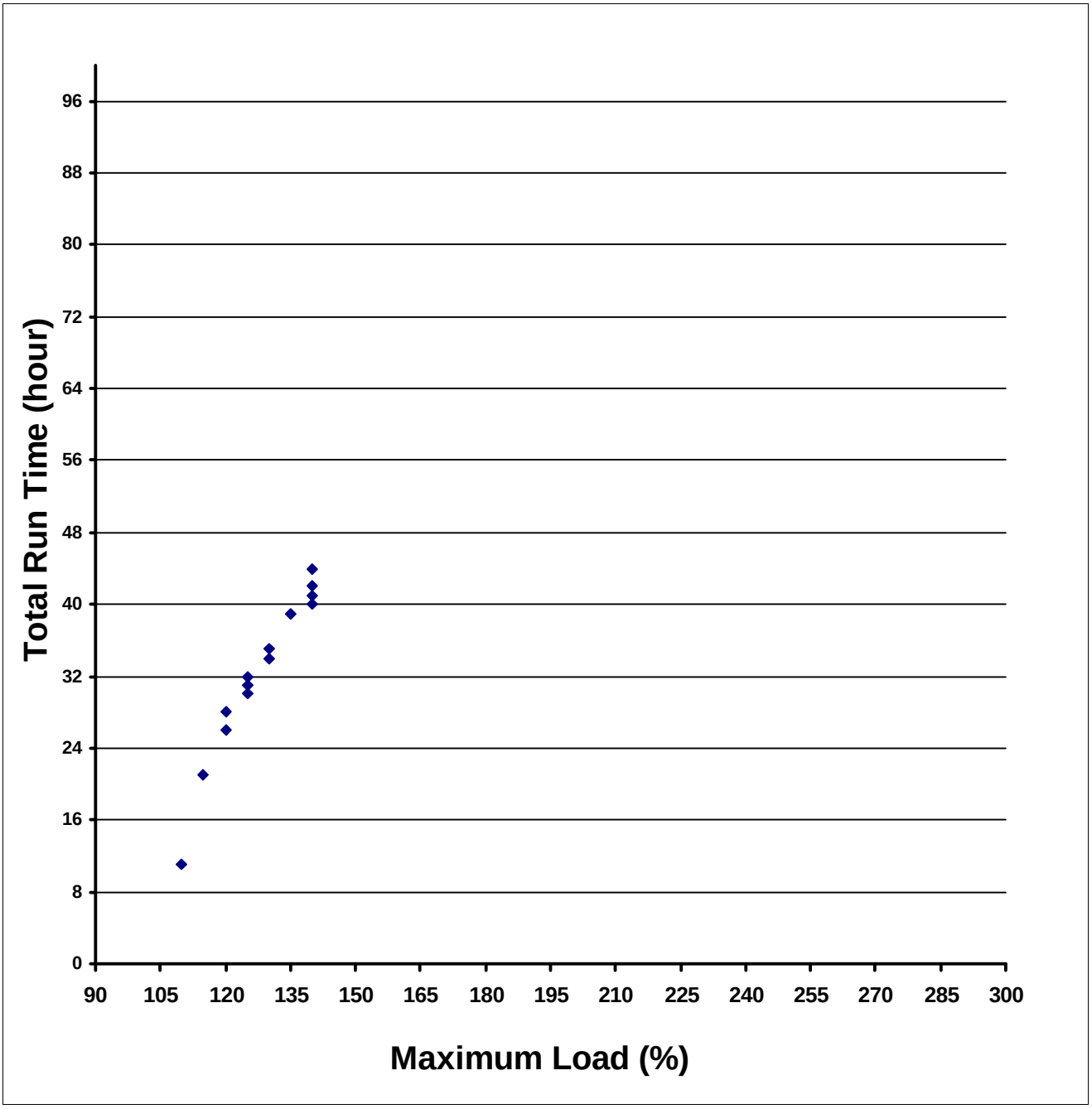

Light Truck Endurance - LT245/75R16 (E)
100% Max Load for 8Hrs
110% Max Load for 8Hrs
115% Max Load for 8Hrs
5% Increase every 4Hrs until failure
RMA Low
RMA Avg
RMA High
Hours to Failure
% of MaX Load
60
56
52
48
44
40
36
32
28
24
20
16
12
8
4
0
160
155
150
145
140
135
130
125
120
115
110
100
11
32
44
18
34
53
3
13
32
4
16
43
490 kPa
550 kPa
490 kPa
550 kPa
120 kph
140 kph
Pressure and Speed

Light Truck Endurance Test Results

Page 1 for Test ID LT245/75R16(E)-120-490-RMA

Size: LT245/75R16(E) **Test Speed(kph): 120** **Inflation(kPa): 490**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Light Truck Endurance Test Results

Page 2 for Test ID LT245/75R16(E)-120-490-RMA

Size: LT245/75R16(E) **Test Speed (kph): 120** **Inflation(kPa): 490**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

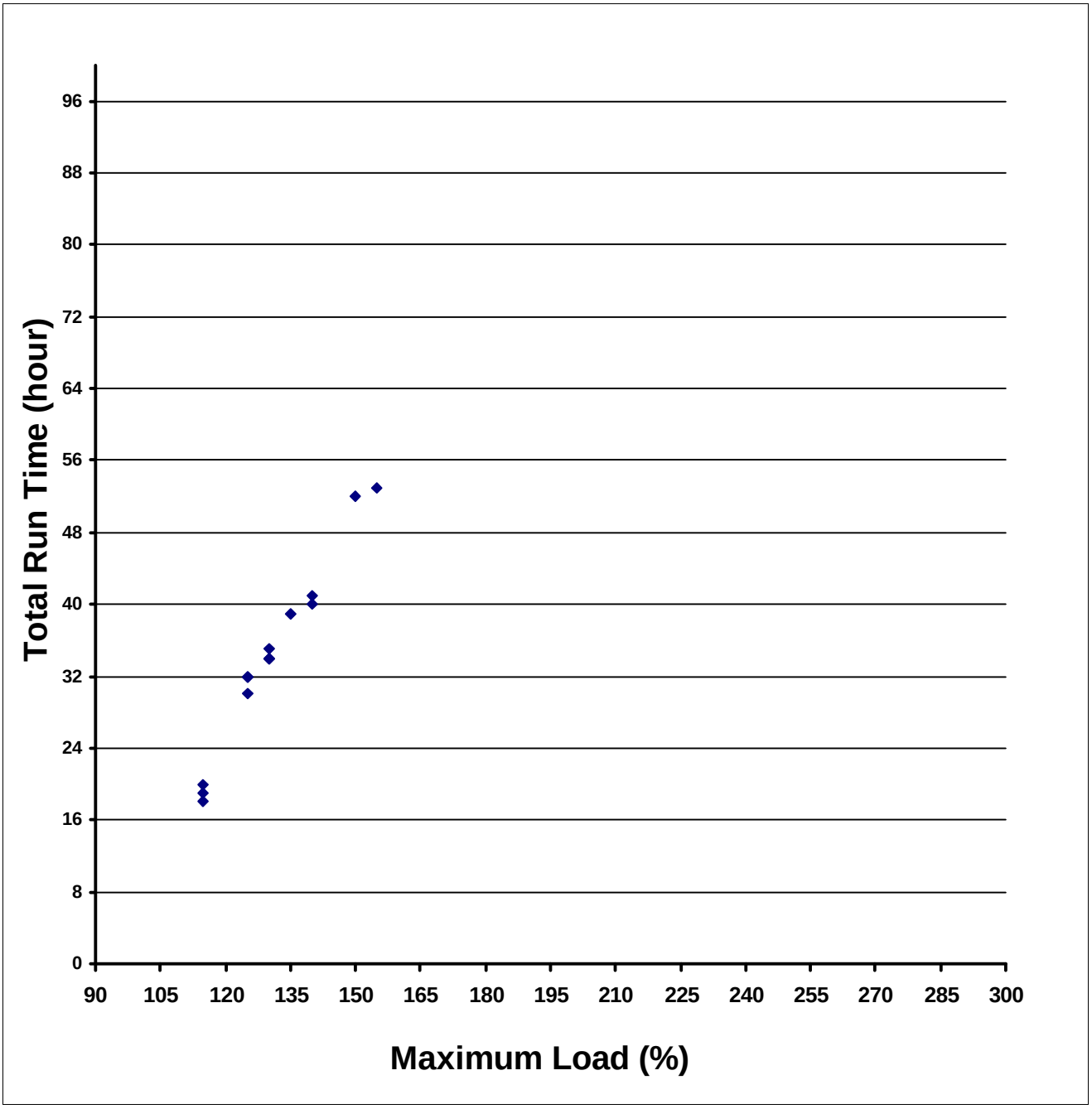
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	140	4	44
	140	2	42
	140	1	41
	140	0	40
	135	3	39
	130	3	35
	130	2	34
	125	4	32
	125	3	31
	125	2	30
	120	4	28
	120	2	26
	115	5	21
	110	3	11
Maximum:	**140**		**44**
Minimum:	**110**		**11**
Average:			**32.429**

Light Truck Endurance Test Results

Page 1 for Test ID LT245/75R16(E)-120-550-RMA

Size: LT245/75R16(E) **Test Speed(kph): 120** **Inflation(kPa): 550**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Light Truck Endurance Test Results

Page 2 for Test ID LT245/75R16(E)-120-550-RMA

Size: LT245/75R16(E) **Test Speed (kph): 120** **Inflation(kPa): 550**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

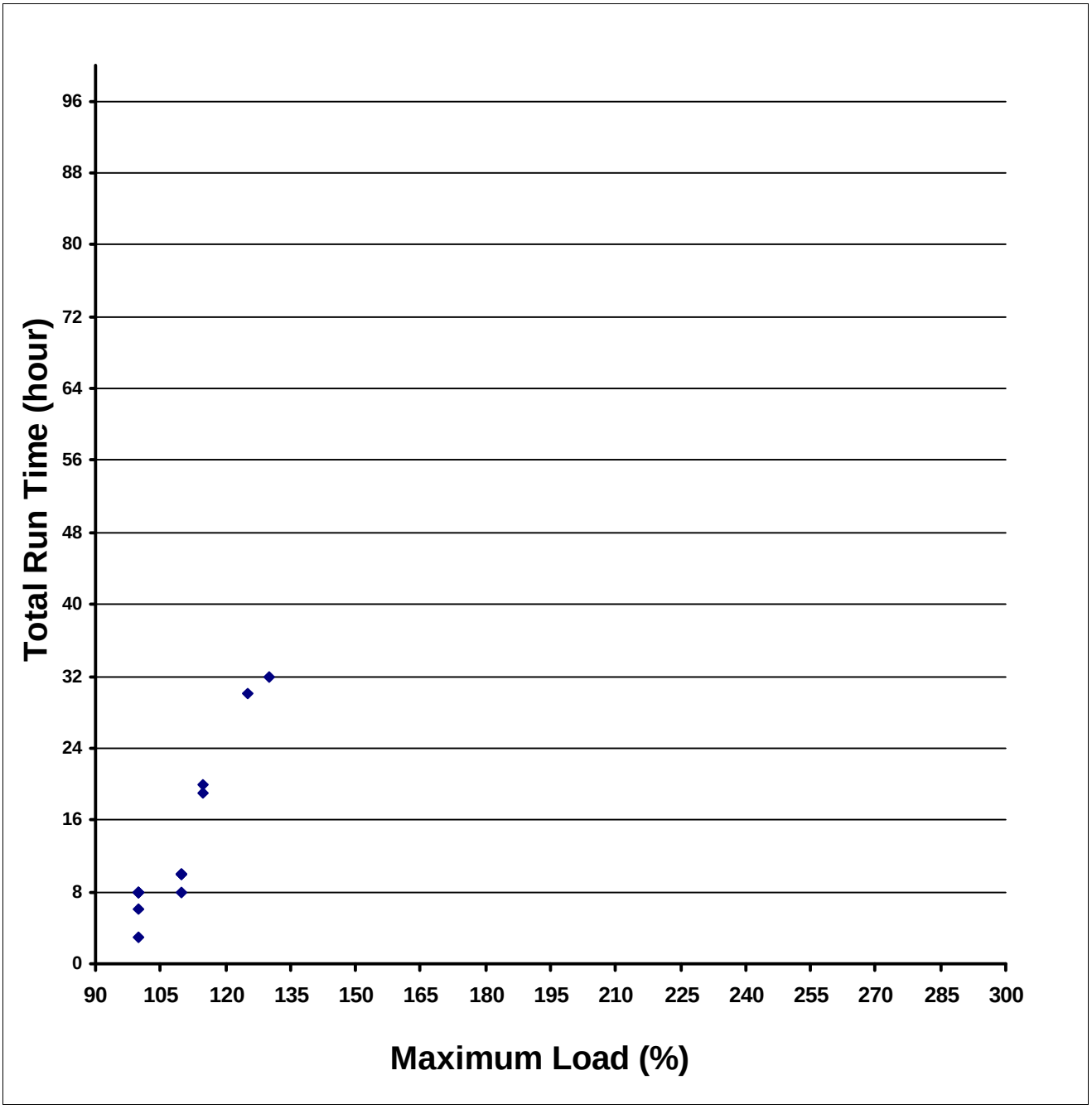
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	155	1	53
	150	4	52
	140	1	41
	140	0	40
	135	3	39
	130	3	35
	130	2	34
	130	2	34
	125	4	32
	125	4	32
	125	2	30
	115	4	20
	115	3	19
	115	2	18
Maximum:	**155**		**53**
Minimum:	**115**		**18**
Average:			**34.214**

Light Truck Endurance Test Results

Page 1 for Test ID LT245/75R16(E)-140-490-RMA

Size: LT245/75R16(E) **Test Speed(kph): 140** **Inflation(kPa): 490**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Light Truck Endurance Test Results

Page 2 for Test ID LT245/75R16(E)-140-490-RMA

Size: LT245/75R16(E) **Test Speed (kph): 140** **Inflation(kPa): 490**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

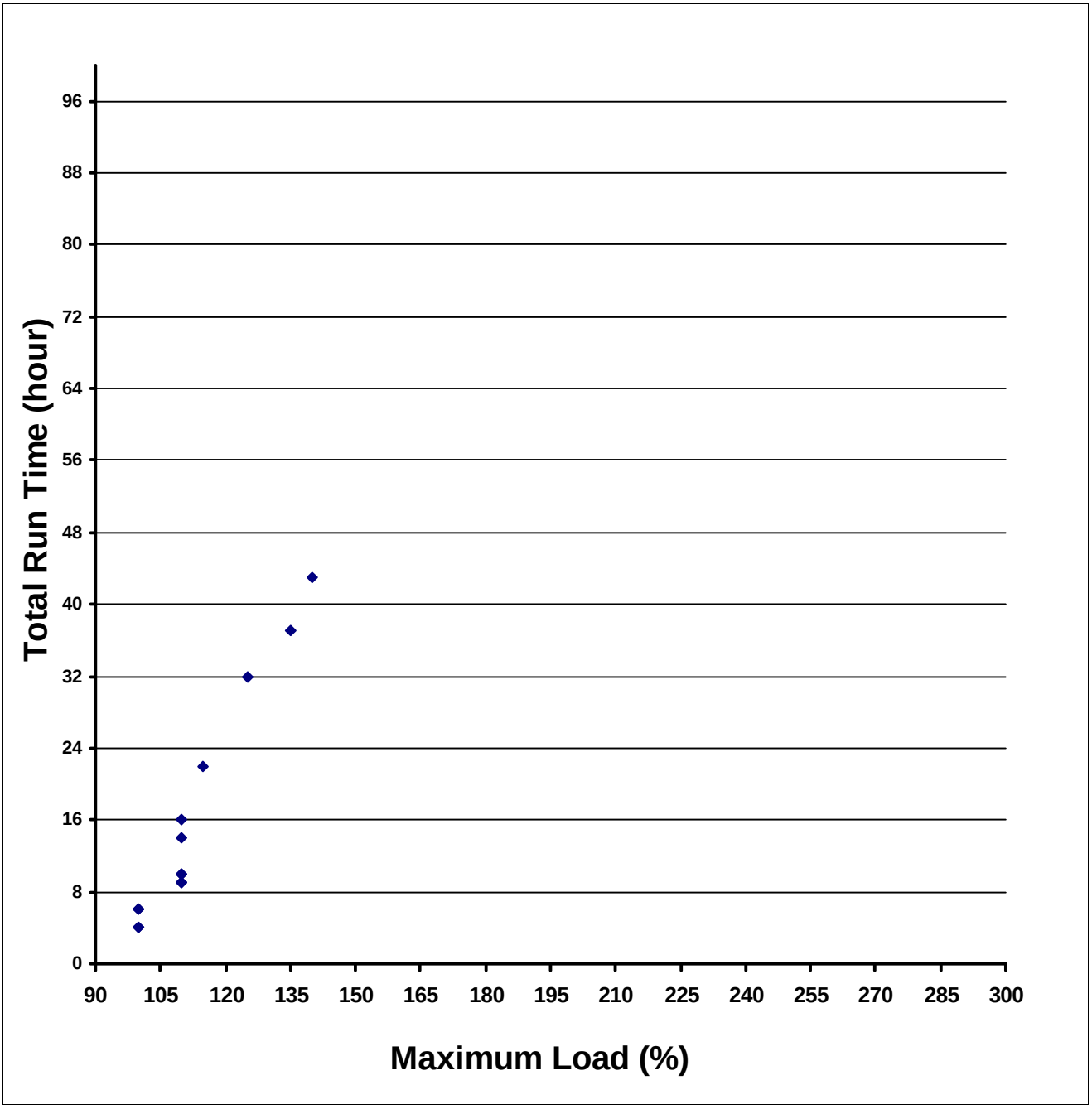
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	130	0	32
	125	2	30
	115	4	20
	115	3	19
	110	2	10
	110	2	10
	110	2	10
	100	8	8
	100	8	8
	110	0	8
	100	8	8
	100	8	8
	100	6	6
	100	3	3
Maximum:	**130**		**32**
Minimum:	**100**		**3**
Average:			**12.857**

Light Truck Endurance Test Results

Page 1 for Test ID LT245/75R16(E)-140-550-RMA

Size: LT245/75R16(E) **Test Speed(kph): 140** **Inflation(kPa): 550**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**



Light Truck Endurance Test Results

Page 2 for Test ID LT245/75R16(E)-140-550-RMA

Size: LT245/75R16(E) **Test Speed (kph): 140** **Inflation(kPa): 550**

Test Condition: **Load=100% for 8hrs, 110% for 8hrs, 115% for 8hrs, then +5% for 4 hour steps to failure**

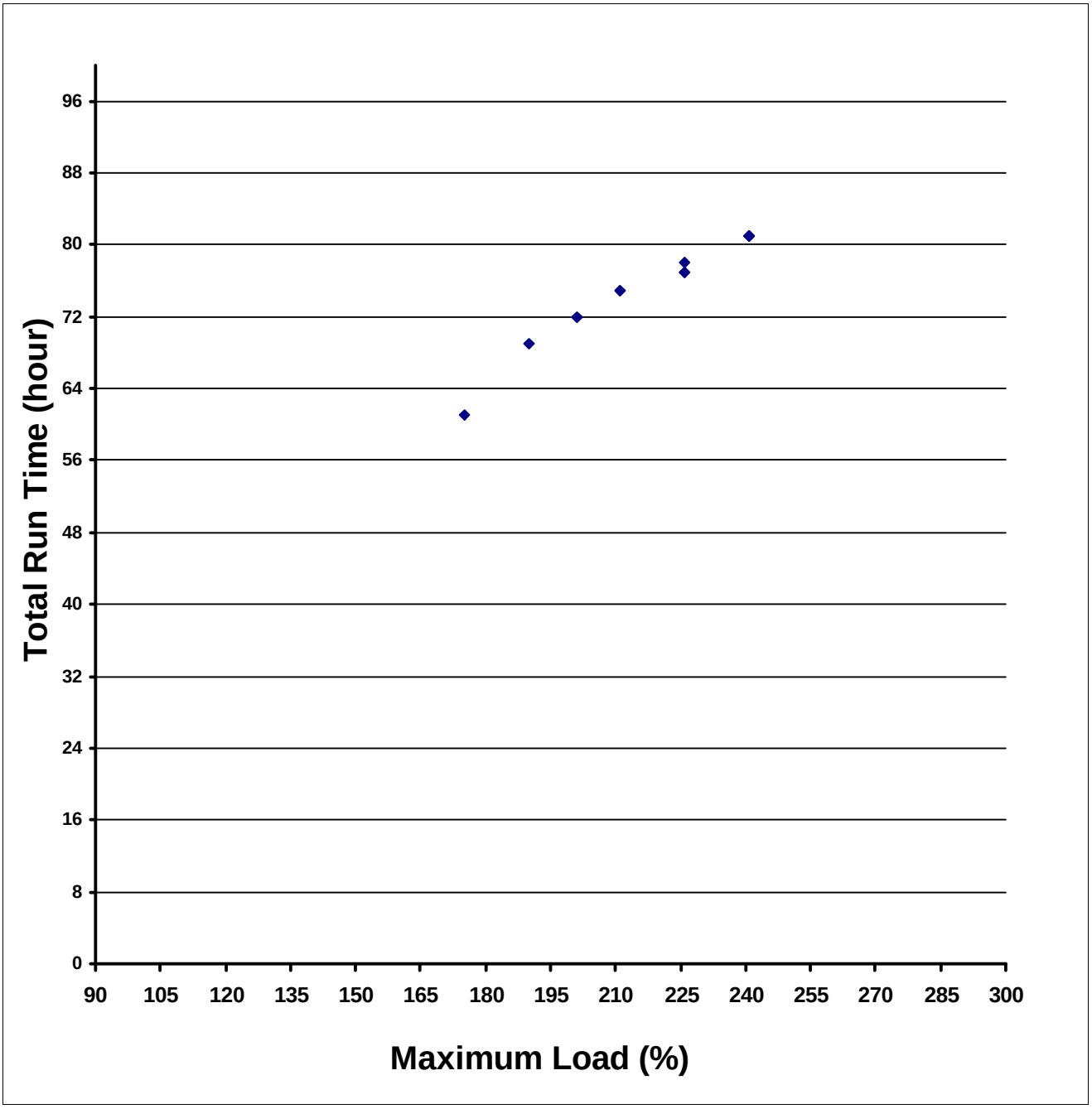
Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	140	3	43
	135	1	37
	125	4	32
	115	6	22
	110	8	16
	110	6	14
	110	2	10
	110	2	10
	110	1	9
	110	1	9
	100	6	6
	100	6	6
	100	4	4
	100	4	4
Maximum:	**140**		**43**
Minimum:	**100**		**4**
Average:			**15.857**

Light Truck Endurance Test Results

Page 1 for Test ID LT245/75R16(E)-65-550-FMVSS119(B)

Size: LT245/75R16(E) **Test Speed(kph): 65** **Inflation(kPa): 550**

Test Condition: **Load=70% for 7hrs, 88% for 16hrs, 106% for 24hrs, then +15% for 4 hour steps to failure**



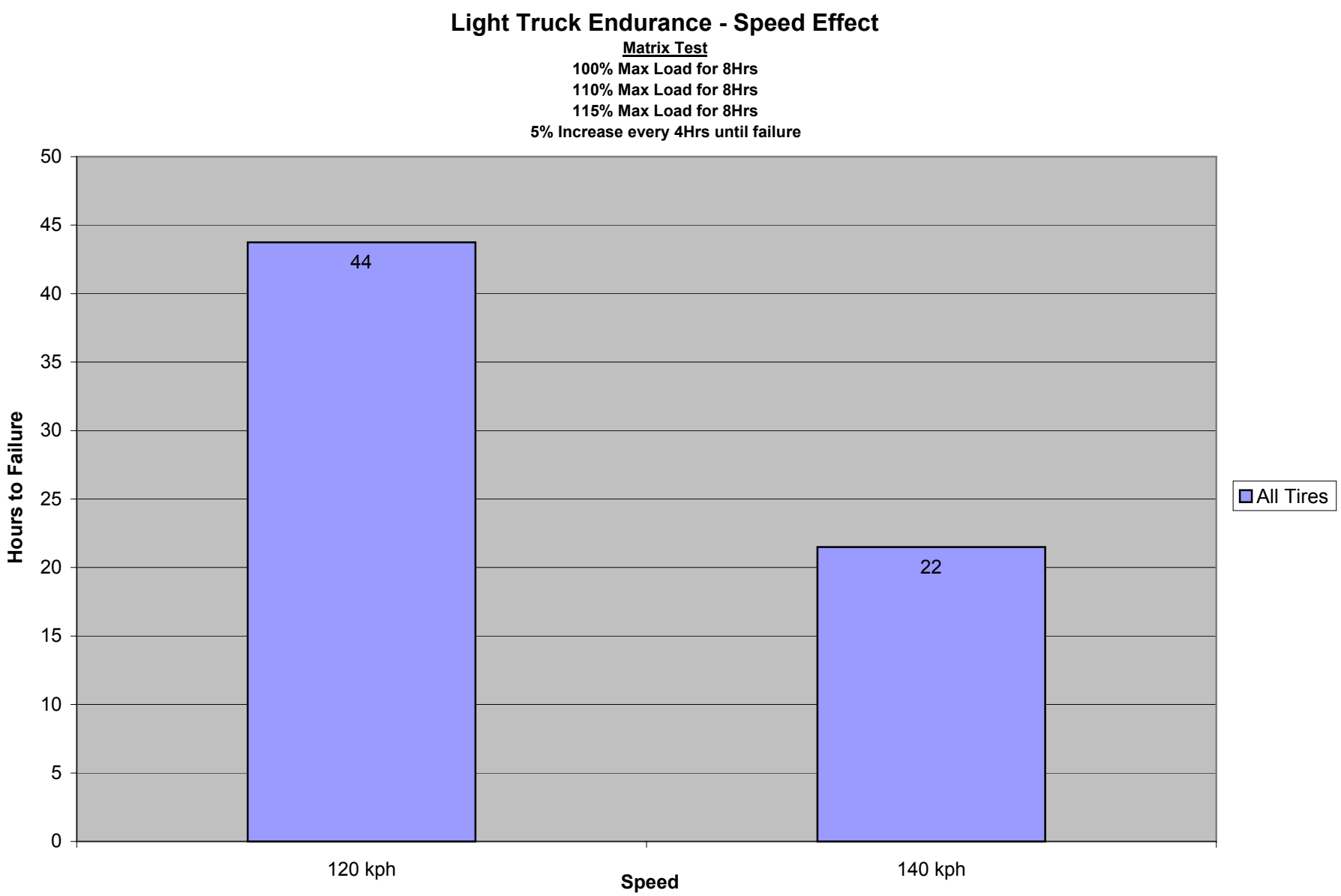
Light Truck Endurance Test Results

Page 2 for Test ID LT245/75R16(E)-65-550-FMVSS119(B)

Size: LT245/75R16(E) **Test Speed (kph): 65** **Inflation(kPa): 550**

Test Condition: **Load=70% for 7hrs, 88% for 16hrs, 106% for 24hrs, then +15% for 4 hour steps to failure**

Test Results:	Load@Failure (%):	Time@Failure (hour)	Total Run Time (hour):
	241	2	81
	241	2	81
	241	2	81
	226	3	78
	226	2	77
	226	2	77
	211	4	75
	211	4	75
	201	4	72
	201	4	72
	190	4	69
	175	0	61
Maximum:	**241**		**81**
Minimum:	**175**		**61**
Average:			**74.917**


Light Truck Endurance - Speed Effect
Matrix Test
100% Max Load for 8Hrs
110% Max Load for 8Hrs
115% Max Load for 8Hrs
5% Increase every 4Hrs until failure
Hours to Failure
50
45
40
35
30
25
20
15
10
5
0
44
22
120 kph
140 kph
Speed
All Tires

Light Truck Tire Endurance Test
RMA Recommendation

- **FMVSS 119 Test (Revised)**

  (Application limited to tires marked “LT” or “C”, and tires with load range “A” through “E”, or load index 124 or below.)

  - **Inflation Pressure**
    - Corresponds to max load rating marked on tire
  - **Speed**
    - 120 km/h
  - **Duration**
    - Three 8 hour steps
  - **Load**
    - Load Range A, B, C, D = 75%, 97%, and 114% max load
    - Load Range E = 70%, 88%, and 106% max load
  - **Ambient Temperature**
    - 38° C ± 3° C

Future Discussion Items

- Tire Sidewall Labeling
- Consumer Information
- Structural Integrity and Durability Testing